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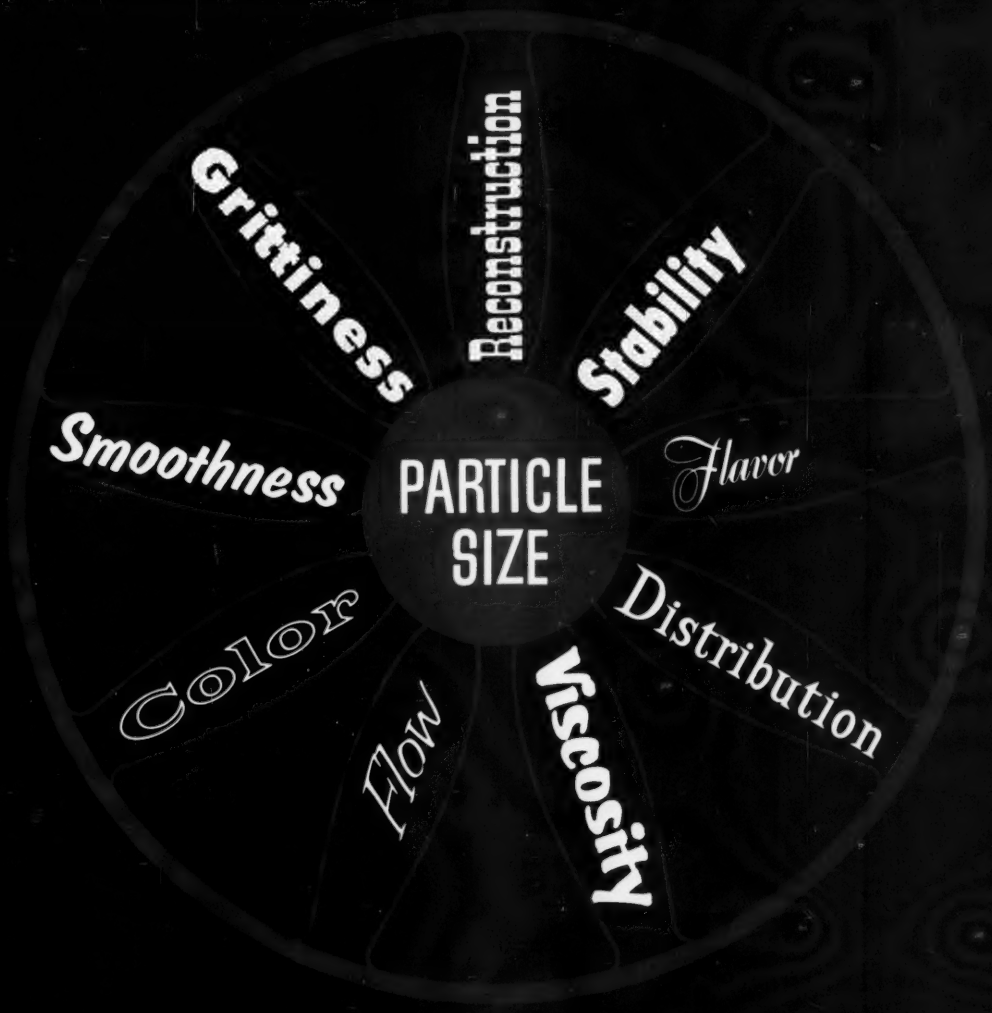
MAY 1960

$1.00

FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION



Particle-Size Control ...Hub of Quality

p. 40

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...the world's first lignin vanillin?

...produced by the world's largest supplier?

...unsurpassed in quality, purity, uniformity?

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FOOD ENGINEERING
FOR MANAGEMENT

MAY 1960

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TRENDS & FORECASTS

SPECIAL

FOOD

SERVICE to EXECUTIVES

Although business has not soared at start of '60s, outlook remains good, says McGraw-Hill Economics Department. Gross National Product should hit $510 billion this year.

Vast changes in structure of labor force will occur in this decade, according to Department of Labor. Demand for workers will rise 25%, need for professional and technical personnel, 41%. Youngsters will fill half of 13.5 million increase in jobs by '70, 26 million entering labor force. Increase in 25-44 year group will be only 1.6 million.

Americans consumed more than $500 million worth of frozen prepared dishes in '59, mostly in convenient containers, USDA reports. Almost 1 in 3 cups of coffee now is instant. Postwar sales of prepared baby foods have grown 230% to billion dollar industry; dollar value of frozen foods has jumped more than 2,700% to $2.7 billion; sales of prepared mixes have more than doubled to $235 million.

Sales of breakfast cereals increased 21% between '54 and '58 to $444 million, Census of Manufactures indicates. Value added by manufacture jumped 37% to $343 million, with 4% fewer workers (11,000).

Pickles and sauces manufacturers produced 28% more in '58 than in '54, for value of $642 million. Value added by manufacture skyrocketed 40% to $200 million, with 4% more employees, or 22,800.

Crop plantings will be only slightly below last year, USDA forecasts. Corn acreage will be about same, or 86 million; spring wheat down 5% to 13 million; soybeans up 6% to 25 million; potatoes, 2% higher, or 1.4 million; rice, about same, 1.6 million.

Winter wheat crop of 977 million bu., 6% higher than last year, is predicted by USDA. Citrus fruit crop will be down slightly, with lemon output up 3.4%.

Frozen potato pack for '59 jumped 38% to 371 million lb., with French fries accounting for 85% of total, NAFFP reports. Frozen whipped and diced potatoes declined slightly to 4.3 million lb., and were 37% below '57.

Canned turnip greens pack fell 34% in '59 to 901,510 cases; mustard greens, down 36% to 485,730 cases; other greens, off 2.6% to 385,594 cases, NCA reports.

Extent of decentralization in meat packing is indicated by fact that less than 40% of hogs slaughtered now move through big terminal markets. Twenty-five years ago, big markets handled over 75%.

Beer consumption increased 3.8% in '59. Sizeable gains are foreseen in Sixties because of 15% increase in 21 to 40 age group.

See Developments to Watch p. 13

Fringe benefit trend is exemplified by sick pay negotiated by Teamsters' California Cannery Council for workers who put in 1,600 hr. per year. For 1 year service, 1 week full and 4 half pay; 10 year service, 10 weeks full and 32 half pay.

California's frozen fruit pack was down 22% in '59 to 165 million lb. But vegetable pack was up 17% to 324 million lb. Total was about same.

Beech-Nut Life Savers and General Milk will build baby food and chewing gum plant in West Germany and expand into other countries of Common Market.

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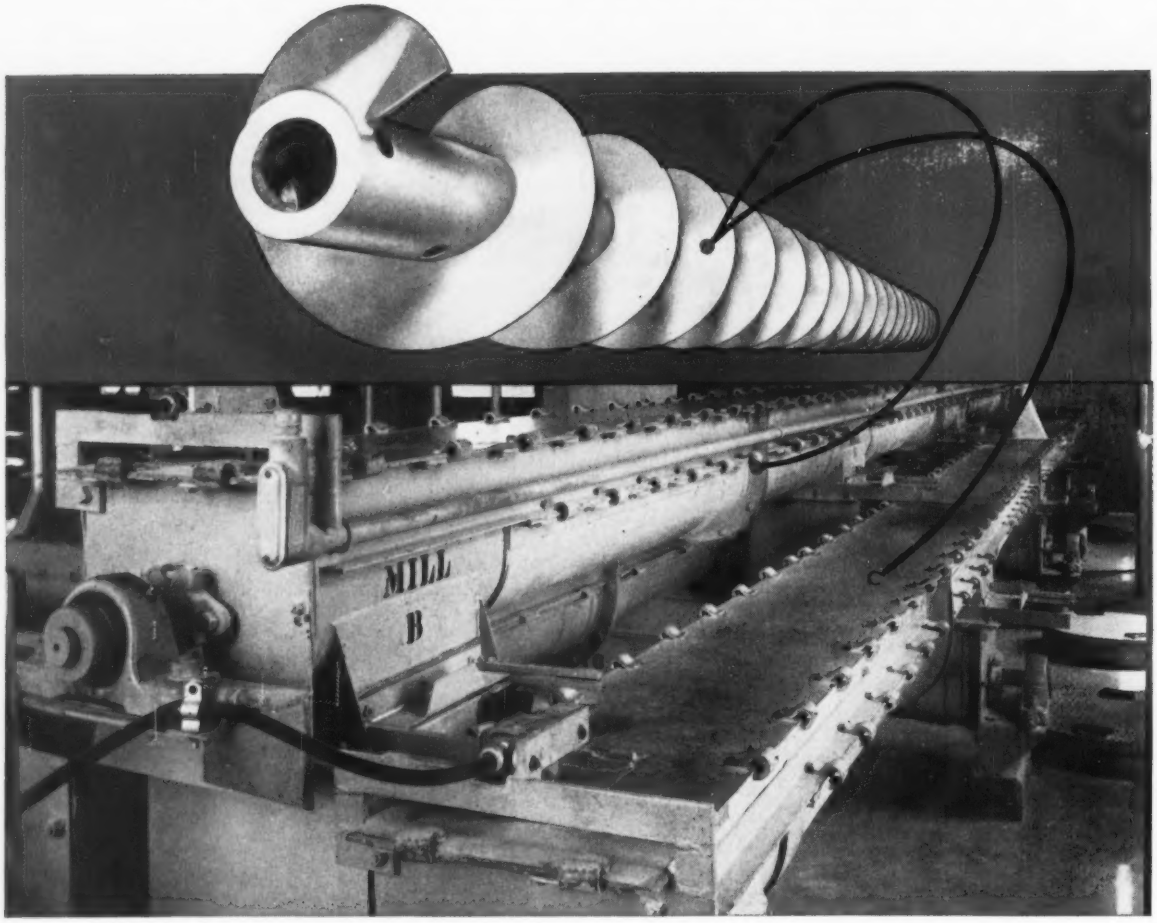

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With Link-Belt, screw conveyor engineering includes far more than just supplying a suitable product. All related aspects of your production are considered—including prior and subsequent handling, plus integration with other equipment. And because Link-Belt handles all details from specification to erection, it means a better-working system with less work for you.

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Schedule of Events

May

15-19—Institute of Food Technologists, convention; Fairmont Hotel and Masonic Temple, San Francisco.
19-20—National Industrial Conference Board, annual meeting; Waldorf-Astoria, N.Y.C.
19-21—Refrigeration Research Foundation, annual meeting; Denver.
22-26—National Assn. of Refrigerated Warehouses, annual meeting; Netherland-Hilton Hotel, Cincinnati.
25-27—Central Atlantic States Assn. of Food & Drug Officials, annual meeting; Colony Motel, Atlantic City.

June

5- 9—National Confectioners Assn., convention & exposition; Bellevue Stratford Hotel & Convention Hall, Philadelphia.
9-10—Canadian Institute of Food Technology, annual conference; Royal Alexandra Hotel, Winnipeg, Manitoba.
9-11—Manufacturing Chemists' Assn., annual meeting; The Greenbrier, White Sulphur Springs, W. Va.
15-17—American Marketing Assn., national conference; Hotel Leamington, Minneapolis.

HORS D'OEUVRES

▶ **Low productivity of white collar workers is nullifying efficiency gains on the production line. That office water fountain has got to go!**

▶ Britain's airlines were troubled recently by mid-air explosions of chocolate-coated marshmallows. But they were able to stop their explosions by punching vent holes into soft candy!

▶ **Dog food manufacturers are worried about the growing scarcity of horse meat. Why should pets get exotic food anyway?**

▶ Said West Germany to Russia: "We won't buy your caviar because it contains boracic acid." Retorted the Russians: "If you don't want it, that's your tough luck!" One way to look at an additives problem.

▶ **Comes now a whiskey-dispensing machine. Very convenient—but it won't listen to your troubles.**

▶ Margarine manufacturers are using 260,000,000 lb. of dry skim milk a year. A consolation prize to the dairy industry?

▶ **For years after 1810, food was preserved in "canisters." Then a tired clerk at Wm. Underwood's plant substituted "cans" to conserve time.**

▶ Coffee won't sober a drunk. Takes time—an hour or more per drink—says Los Angeles Safety Council. But coffee will help to pass the time.

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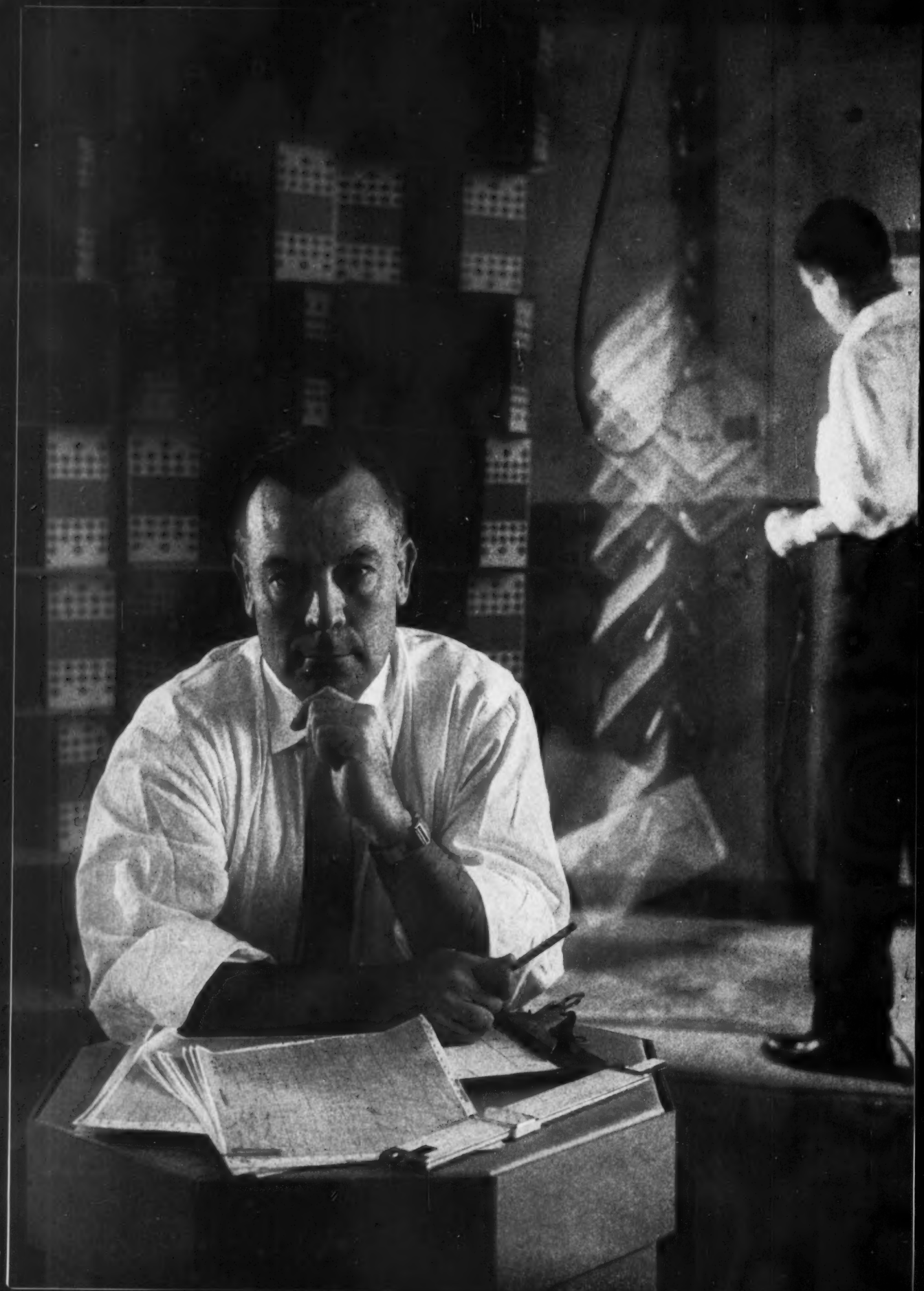

His specialty is collision insurance

And making sure you don't collect on it.

With Thorne Kitchel there's precious little chance. The crash program he puts your containers through assures that the design and construction are adequate for your product before production begins.

Thorne heads up a team of seasoned "security analysts" at Union-Camp's packaging laboratory. In his 15 years as a corrugated box specialist, he has tested thousands of boxes designed to protect all kinds of products. He's also helped save thousands of damage-claim dollars for their owners in the process.

At the Union-Camp packaging proving ground, Thorne and his staff test new shipping containers for their ability to withstand almost any conceivable threat to product safety. Sudden rail-car stops and starts, for example. Punctures from sharp objects. Resistance to extremes of temperature. Accidental falls. Vibration. Or the extent to which a shipping container will protect your products under the crushing pressure of high stacking.

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Fortify and color your margarine in one operation. Roche blends pure vitamin A and beta carotene in vegetable oil, makes delivery to you in sanitary tin cans. Ideal for batch mixing.

DEVELOPMENTS TO WATCH

SPECIAL FOOD SERVICE to EXECUTIVES

In new irradiation research program, QMC will attempt to prove that rayed products are wholesome and tasty. AEC will study irradiation of specific items, principally fish and fruit.

Irradiation sensitizes to heat, synergism increasing with dose. F_o value for *C. botulinum* can be cut to one-fourth by pre-irradiation, according to L. L. Kempe, University of Michigan.

In pilot project, Russia will irradiate 25,000 tons of potatoes, in special containers that pass source three times for even treatment. Russian scientist believes treatment also will extend storage life of other vegetables and fruit.

Process for producing instant sweet potato flakes with good color and flavor has been developed at USDA research lab. Pilot plant will process sweet potatoes from this year's crop.

Frozen fried eggs, packaged in aluminum foil for heating in toaster, have been developed at Purdue University.

Flavor-bearing materials have been isolated from meats by USDA researchers by water extraction, and freeze-dried to flavorful powder.

Use of antibiotic tylosin to reduce heat treatment in food preservation shows promise in NCA research. Evaluation tests with *C. botulinum* must yet be made, however.

Reduction of cavities in teeth of rats resulted from feeding large quantities of milk, chocolate milk, ice cream and cheese, to balance carbohydrate intake, says Nutrition Foundation.

Physical and emotional stress increased cholesterol level in blood of test animals almost 100% in a week, according to National Institutes for Health. Tests were made by injecting adrenalin into dogs.

Shelf life of frankfurters was increased by surface treatment with propyl esters of p-hydroxybenzoic acid in tests at Rutgers. Approved by FDA at 0.1% level, inhibitor is product of Chemo Puro.

See Who's Building What p. 17

Cuba is building commercial plant to dehydrate sugar cane juice for animal feeds. Output of 300,000 tons is planned for 1961.

Sap from maple trees is being extracted with milking machines by Vermont farmer. Plastic hose connects machines to tree taps.

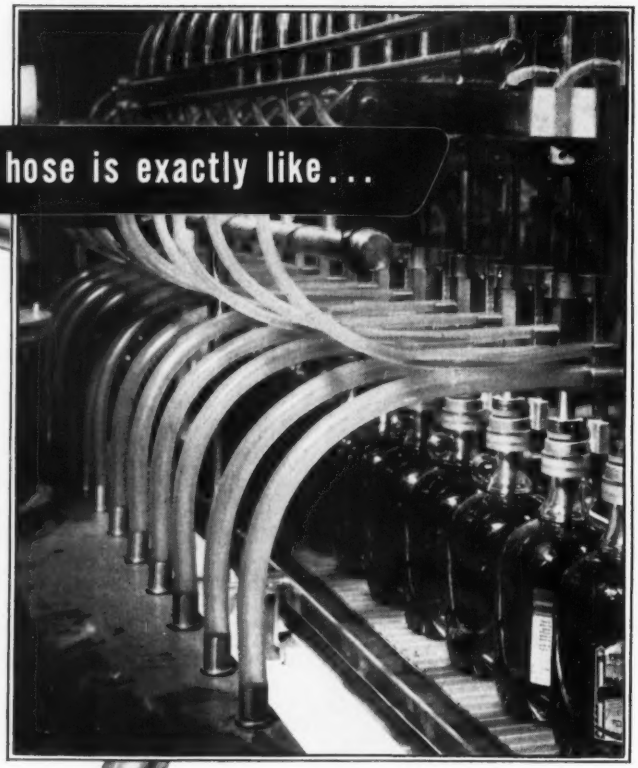
Wide-range ultrasonic flowmeter is actuated by difference in upstream and downstream velocities of waves from two crystal transducers mounted outside of pipe. It is British development.

Washington Report p. 19

New high-performance heater-mixer has broken flight screw in cylinder with series of mixing pins. Screw rotates 30-90 rpm. and reciprocates 20-30 times per min. Both cylinder and screw can be used as heat exchangers during mixing. Baker-Perkins developed it.

Conveyor belting made of Mylar and vinyl provides quick product release, is easy to clean, chemically resistant, long lasting, and dimensionally stable from 0 to 275 F., Lassiter Corp. reports.

No other food and beverage hose is exactly like...



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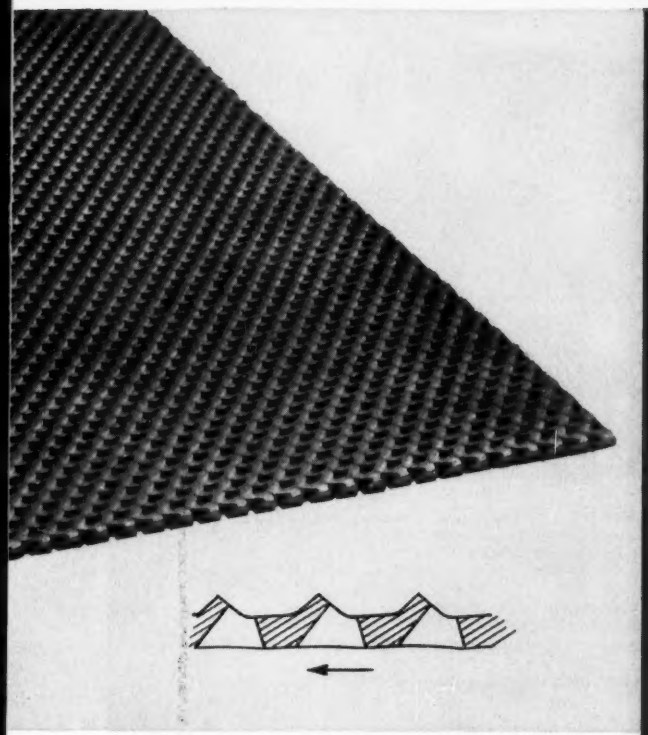
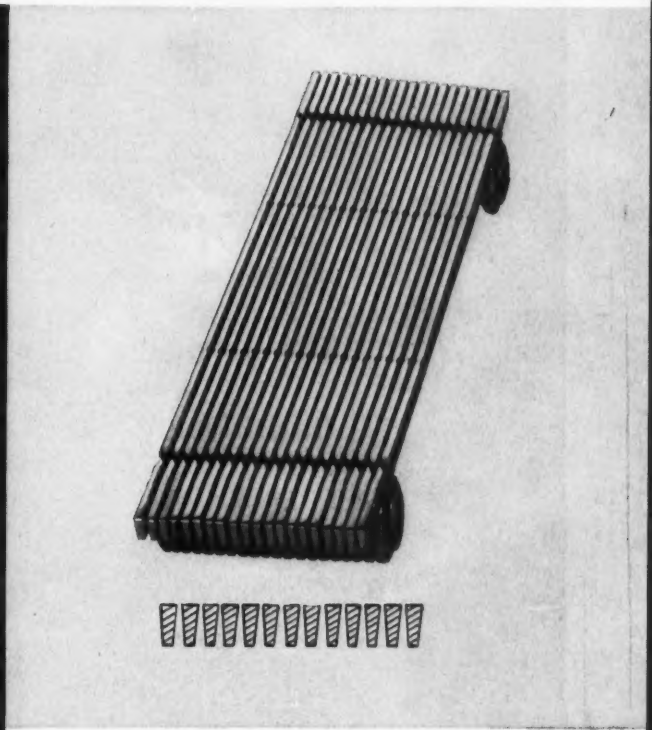


CONIDURE* sheets are available in a complete range of hole sizes and rolled surfaces. The working side of Conidure sheets has shovel-like humps that guide material into the narrow openings, increasing screening action. The extreme taper of the hole prevents clogging or blinding.



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New **RIMA** *Screens*

New Rima shaped-wire screens for coal, paper and food processing and water or sewage filtration have special capacity advantages over standard wedge-wire screens because of high-narrow profile wires that provide larger open area. The unique cross bar and spacing lugs keep wires uniformly separated for greater efficiency in screening.

FOR COMPLETE INFORMATION on New Conidure and Rima Screens, write for new illustrated catalog to NATIONAL-STANDARD COMPANY, NILES, MICHIGAN

NAME_____

COMPANY_____

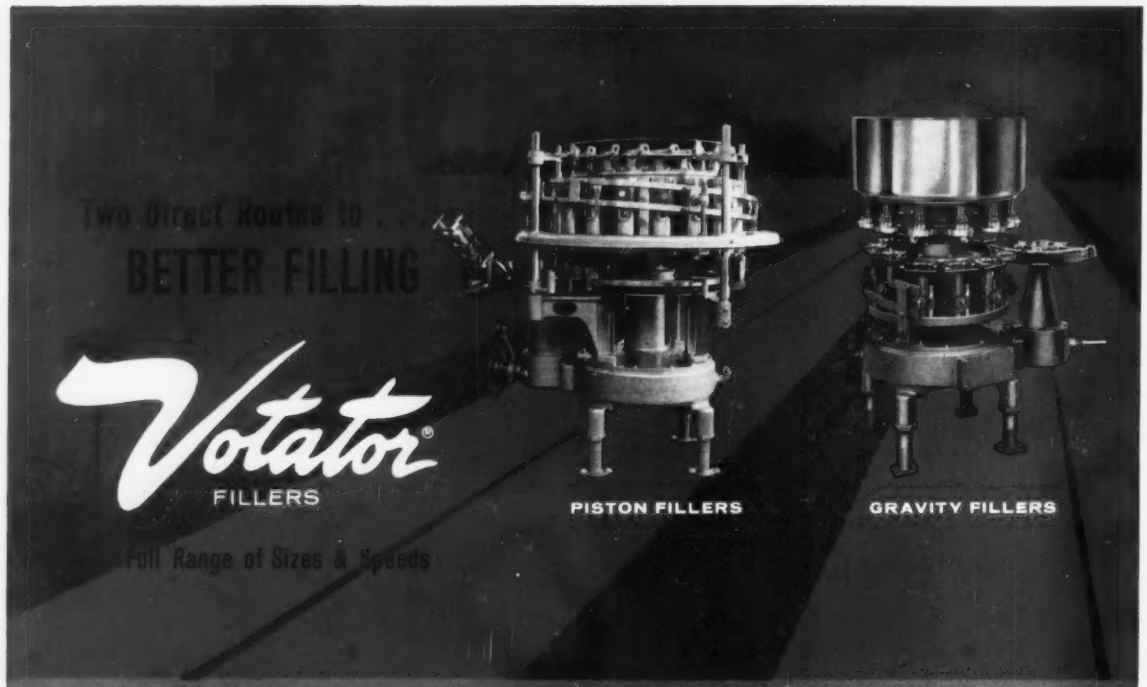
ADDRESS_____

NS NATIONAL-STANDARD COMPANY

Cross Perforated Metals

NATIONAL-STANDARD COMPANY

Carbondale, Pa.



VOTATOR rotary piston fillers offer specific advantages, such as greater rigidity with *four point* suspension—thus greater accuracy, self-cleaning valve seats, fine micrometer adjustment *even while in operation*, and easy accessibility of valve guides, ports and rollers. Large diameter Nylon piston and valve rollers reduce wear. In addition, VOTATOR piston fillers feature high-speed no-container, no-fill mechanism, a fully enclosed gear case, adjustable legs, and a wide variety of valve sizes.

VOTATOR gravity fillers are designed for filling liquids having free flowing characteristics. Special seal pads at the base of the valve assembly make a tight seal possible even if top flange of container is not perfect. Extra large valves reduce foaming and increase accuracy. Extra long valve sleeves provide smoother operation, reduce leakage and prevent sticking. Changes for different size containers are quick and easy. Adjustable legs, fully enclosed gear case, a variety of valve sizes and Nylon lifter rollers are more features of VOTATOR gravity fillers.

Model No.*	P6L	P9L	P12L	P18	P18L	P27	P27L	P36	P36L	P6G	P9G
Max. Capacity of Fill (oz.)	40	40	40	20	40	20	40	20	40	160	160
Max. Container Dia.	404	404	404	303	404	303	404	303	404	610	610

Model No.*	G6L	G9L	G12L	G18	G18L	G27	G27L	G36	G36L	G6G	G9G
Max. Capacity of Fill (oz.)	48	48	48	32	48	32	48	32	48	128	128
Max. Container Dia.	404	404	404	303	404	303	404	303	404	603	603

Let us show you which is best for you

VOTATOR Fillers are designed to provide accuracy and speed throughout all practical production ranges and container sizes.

In both the piston and gravity types, ranging from 6 through 36 stations, smoothness of operation, ease of integration with associated equipment, rugged, trouble-free construction, and expert know-how and service on each individual installation assure top packaging performance and economy.

Write or call for additional specific information. Bulletins describing both piston and gravity fillers are available upon request. There is no obligation.

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CHEMETRON CORPORATION
Louisville 1, Kentucky
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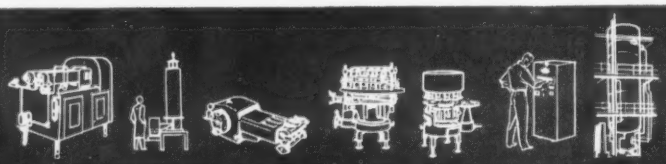


VOTATOR CONTINUOUS PROCESSING EQUIPMENT FOR CHEMICAL & FOOD INDUSTRIES • VOTATOR PISTON & GRAVITY FILLERS • VOTATOR PLANTS FOR FATTY OILS INDUSTRY • THERMEX DIELECTRIC HEATING EQUIPMENT

WHO'S BUILDING WHAT...

Monthly Report: Food firms to spend $10,982,285 for expansion

Proposed Work

Farmland-Fair Lawn Dairies, Garfield, N. J., plant, $500,000.

Golden Grain Dairy Co., Lewiston, Idaho, dairy processing plant, $200,000.

H. L. Hunt Products Co., Nacogdoches, Tex., chicken/foods processing & canning plant, $300,000.

Lakes Dairy Co-operative, Detroit Lakes, Minn., dairy plant addition, $200,000.

Long Meadows Dairy, Durham, N. C., dairy plant addition, $125,000.

Morrison & Schiff, Inc., Brighton, Mass., meat packing plant, $118,000.

Pepsi-Cola Co., Moncks Corner, S. C., bottling plant, $135,000.

Pet Dairy Products Co., Winston-Salem, N. C., warehouse, $250,000.

Three Brothers Bakery, Houston, bakery, $100,000.

United Salt Corp., Brownsville, Tex., plant, $4,000,000.

Contracts Awarded

Borden Co., Chicago, ice cream plant addition, $110,000.

Elm Farms Food Co., Brighton, Mass., two warehouse additions, $500,000.

Entiat Warehouse Co., Entiat, Wash., fruit warehouse & packing room, $256,000.

J. H. Folger & Co., South San Francisco, plant, $637,193.

Foremost Dairies, Inc., Duluth, Minn., milk plant addition, $119,534.

B. W. Iley, Rusk, Tex., poultry processing plant, $118,000.

Jewel Tea Co., Melrose Park, Ill., baking plant addition, $1,200,000.

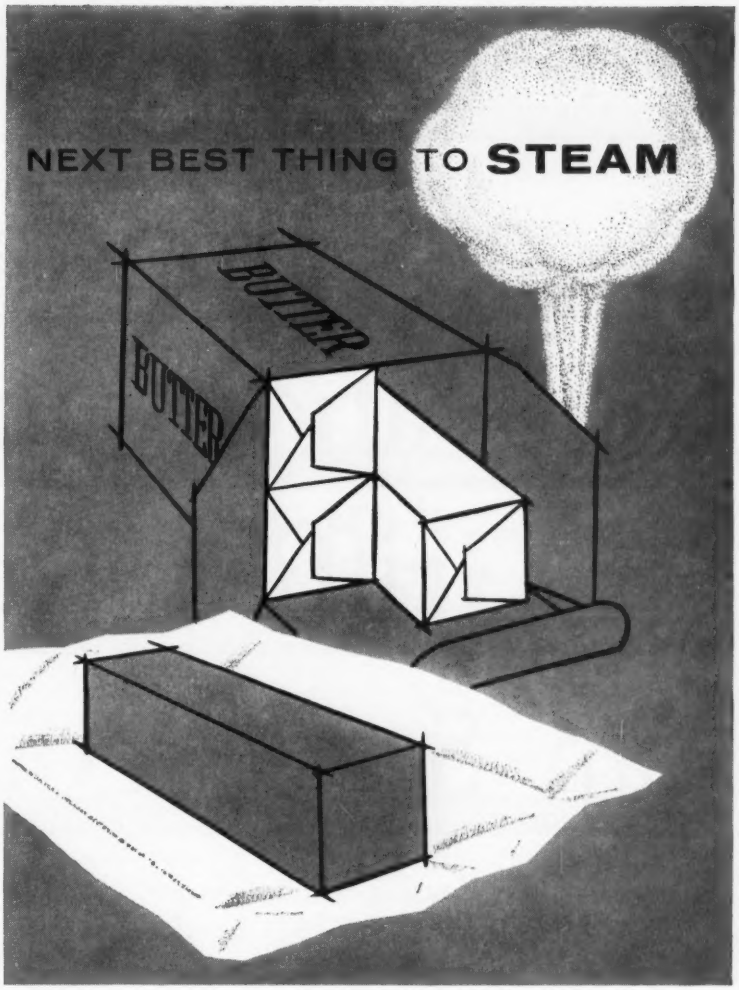
Minneapolis Brewing Co., Minneapolis, plant additions, $1,300,000.

Nolde Bros., Inc., Richmond, Va., bakery, $125,000.

Royal Crown Cola Co., Granite City, Ill., mfg. & canning center, $453,558.

Seven-Up Bottling Co., Hoquiam, Wash., bottling plant, $110,000.

John H. Wilkins Coffee Co., Philadelphia, warehouse & office, $125,000.



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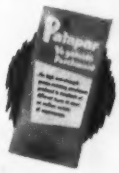

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Color Bill Moving Despite Delaney Tie

Testimony of a panel of scientists before the House Commerce Committee would seem to indicate that the vital color additives bill isn't yet free of the Delaney "no cancer" clause.

Even so, the bill's passage appears assured. It's already through the Senate, and Committee Chairman Harris has labeled it a "must" for this session.

In the ranging of the Delaney question by the panel—made up of a dozen university and Government scientists—the tightest stand was taken by the three savants from the National Cancer Institute. They were agreed that since science knows so little about what causes cancer, the flat ban on any carcinogen should stay.

The independent scientists weren't so sure. They saw wide grounds for disagreement on just what a carcinogen is. In final analysis, they said, it depends upon how the substance is tested and for what use it is intended.

Salt injected under the skin, for instance, causes cancer—but does this class it as a cancer-causing agent? Such factors, declared these scientists, indicated there is more feasibility in allowing scientific discretion in individual cases.

But it's questionable whether these arguments "reach" the voting Congressmen with enough impact to bring them to soften the Delaney clause.

One possible modification being weighed would involve setting up a scientific panel to advise FDA in borderline cases or to act as a board of appeal from FDA decisions. Such an advisory board is already active on pesticides.

Delaney View May Swing Ike Reports

There's probability that Government scientists who favor short shrift for cancer-causing agents will dominate the key reports to the President (FE Mar., p. 19).

Still, some hope is held for "common sense anti-Delaney" pleas from USDA, which also wants to see more room for scientific judgment on additive tolerances.

Reports from both individual scientists and the department are now being gathered by George B. Kistiakowsky, Ike's chief science adviser. He will attempt to formulate an official administration policy out of the divergent views.

But it doesn't look like the polished draft will be posted in time to affect the vital color bill.

If the report should favor more leniency, however, it likely will have its affect in the next session of Congress, when there'll be time to consider amendments to the color and food additives laws.

FTC Report Still Tardy; Guides Coming

That long-awaited FTC "Chapter I" report on food-field economic concentrations and chain merchandising practices still wasn't sprung at this writing. Thus, the industry continues on tenterhooks. It fears this tome's revelations may herald new anti-trust actions.

There's a simple reason for the report's delay: No urgent priority was tagged on the work at the Government Printing Office.

FTC had also promised guides on merchandising and advertising allowances—what the operator can and cannot do. These will probably be issued sometime in May. Considerable pressure has been put on the Agency to map the proper-practice roads that will keep operators clear of Robinson-Patman violations.

Commissioners are now studying a special staff report preparatory to shaping up such guides. But don't look for them to cover all the "gray areas," for that would take volumes. Instead, general-policy outlines will be spotlighted.

Additive Grind Continues; Harvey Clarifies Picture

FDA works on hundreds of extension requests; polypropylene gets nod; no bannings yet

FDA is gradually working its way through some 600 remaining requests for 1-yr. time extensions on food additives (see newest listings, p. 77).

At latest count on suppliers' petitions for clearance, 29 were waived as not being food additives, 6 were withdrawn, and final clearances were granted 10. So far none has been banned.

First regulations on a packaging material are for polypropylene. They permit use under specific conditions, with methods included for determining amount of migration into food (see special article, p. 95).

How the problems are viewed by FDA meantime has been clarified by Deputy Commissioner John L. Harvey in a recent talk before the Chicago Section of IFT.

"Working" the many hundred requests for extensions is not, he said, "just a matter of getting enough people to handle them. Instead, it's a matter of having adequate scientific personnel to evaluate each one."

Involved, too, are hundreds of letters relative to the Amendment—a flood which finds the Agency far behind on replies.

Extension Is No "Accomplishment"

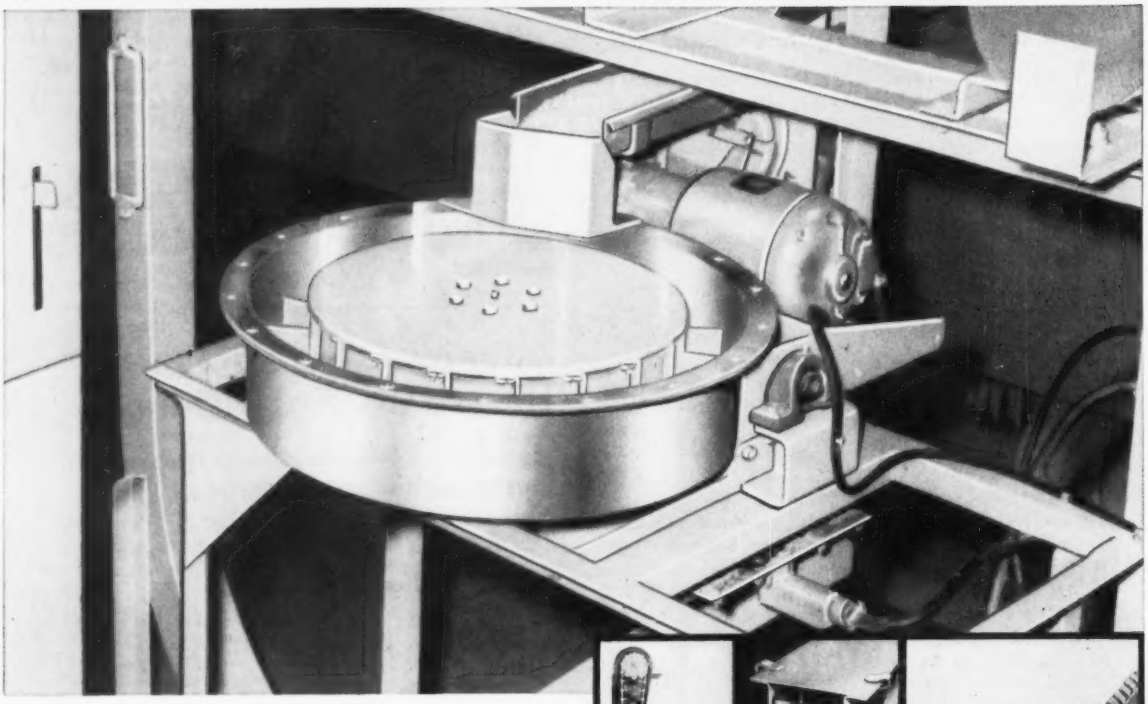
Particularly emphasized by the Commissioner is the fact that a time extension is not an "accomplishment" for the supplier. Rather, it's just a temporary easement, with much still to be done. And there remains the call for spelling out an adequate method of analysis for each item.

"But we expect situations," he added, "where we will be in agreement with industry's conclusion that there is no adequate chemical method for determining the presence of certain packaging-material migrants in foods and where, to the best of knowledge, there's no reasonable expectation that such a method can be devised."

Here, he pictured FDA as ready to consider alternate methods of checking. And, he said, "this certainly presents a challenge to food technologists."

Further, said Commissioner Harvey, failure of a substance to make the "White Lists" shouldn't be taken as

STEPHENS-ADAMSON



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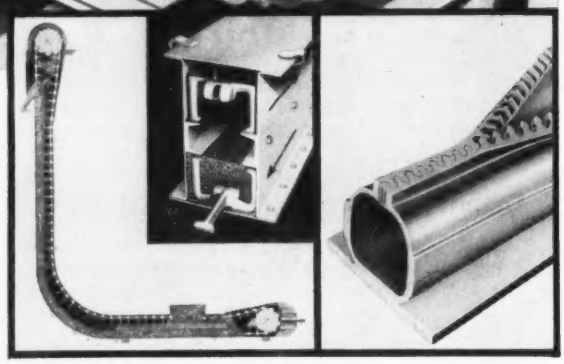
The STEPHENS-ADAMSON Continuous Weigher weighs material continuously while in motion with extreme accuracy. Material entrance and exit points are in line with pivot axis of weigher providing for easy installation within existent processing operations and completely eliminating all discharge terminal errors. The unit handles hot material with equal accuracy. Minimum headroom is required. The weigher can be adapted with control equipment for accurate gravimetric feeding without requiring extensive plant alterations. STEPHENS-ADAMSON engineers will be happy to work with you on automating your processing operations.



S-A REDLER CONVEYOR

Skeleton flights, linked together and moving through totally enclosed casings, induce the mass movement of powdered, granular or flaky bulk materials in any direction. Gentle conveying action and sealed casings mean maximum protection for materials handled. Redler units combined with Continuous Weigher offer automatic operation. Request Bulletin 358.

S-A ZIPPER CONVEYOR

Literally a moving, material-carrying conduct, the zipper closed belt, conveyor-elevator is capable of transporting bulk materials in any plane, to considerable heights and around obstructions. Bulk materials are conveyed free of breakage, agitation or segregation within the sealed and dustight belt. The zipper combined with Continuous Weigher is ideal for automatic feeding operations. Request Bulletin 349.

WRITE FOR BULLETIN 958

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WASHINGTON REPORT

automatic conclusion that the substance is a food additive. Suppliers, he accented, are at liberty to decide a substance is generally recognized as safe. "And given sound data, we anticipate no disagreement on our part." He added that here he meant presentation of broad "scientific community" data.

In conclusion, he noted that there has been no "onslaught of seizures," as many persons had seemed to expect. However, he reminded industry that Agency plant inspectors are giving special attention to additive substances, and use of unlisted ones will lead to direct checkups by Washington.

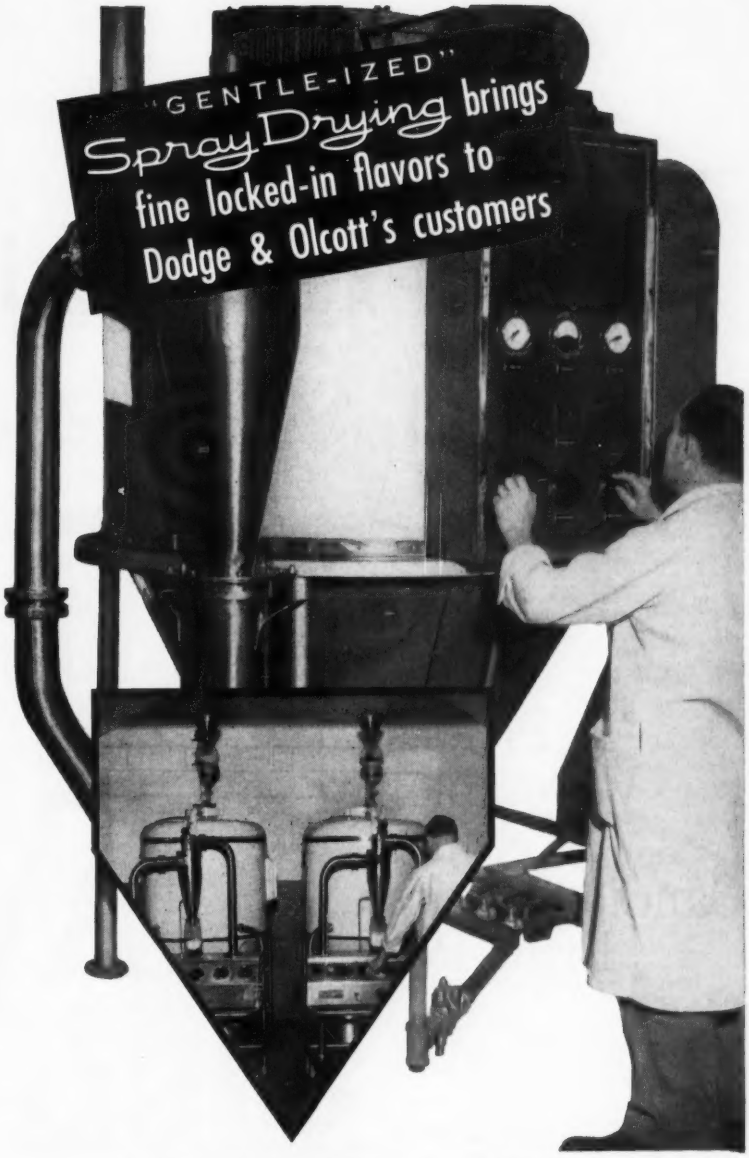
BRIEFS

Those ice cream standards are still stalled—and you can figure on them staying stalled for some time to come. Latest of many hobbling factors is a flow of special data on emulsifiers as a result of the new food additives law. This development has brought FDA to postpone further standards action until it has clearance on these various agents—so that a complete list of additives that may be used in ice cream may be included.

All re-packaged imports are targeted by a bill that's passed the House. But it seems destined to be hung up in the Senate Finance Committee. Called for is labeling of all such goods to show country of origin—a requirement deemed too restrictive by a number of importers and, in fact, viewed by the Administration as unfeasible.

Granting of tax incentives for those who "set up" overseas hit a flood of opposition on the House floor, hence looks like a dead letter for this year. Idea was to encourage such foreign projects by deferring U.S. taxes on earnings subsequently reinvested overseas. The House Ways & Means Committee has now made another attempt, limiting the bill to investments in underdeveloped countries.

The Food-for-Peace Program now has a top White House push behind it, Ike having named Don Paarlberg, his special assistant for economic affairs, to coordinate the Federal effort. Aim of the project is to engineer a strategic flow from the mounting farm surpluses into friendly nations abroad.



With the installation of Nerco-Niro spray dryers, Dodge & Olcott has extended its line of quality flavor bases. Liquid solutions are now being processed through spray dryers where instantaneous and "Gentle-ized" evaporation produces a flavor powder with exceptional shelf life, free flow, and superb taste perfection. The unique design and positive control of air, temperature, and droplet size in the dryer means top quality and constant uniformity in food flavors being processed by this company.

The Nerco-Niro engineering staff is available for consultation concerning your specific problem whether it be research, testing, engineering, or custom drying.

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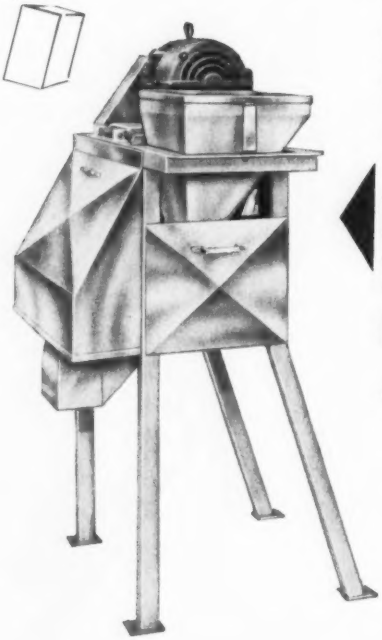

For Pickles, Vegetables, Fruits, Candied Fruits, Fruit Peel

The New Urschel Model **"RA" Dicer, Strip-Cutter and Slicer** gives you these *new* advantages: *widest range of cuts—from relish sizes of 1/16" x 1/8" x 1/8" to full 3/8" cubes, strip-cuts and slices ▶ more perfect dices than ever before ▶ operating speeds are quickly changed to provide the best dicing efficiency for various products and size cuts desired—means maximum capacity and higher quality cuts ▶ saves your valuable process syrups ▶ no product crushing—all the juice is locked in ▶ plugging is avoided by more direct product transfer from slicing to dicing knives ▶ stainless steel product contact surfaces ▶ one motor instead of two—mounted above operating parts for complete protection ▶ capacity up to 10,000 lbs. per hour*

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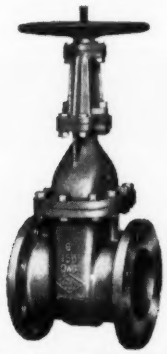

In this **Split Wedge Gate**

you can see why it pays to

Specify JENKINS for STAINLESS STEEL Valves, too

This picture shows the many points of excellence in the design and construction of Jenkins Fig. 1327 Split Wedge Stainless Steel Gate Valves. Compare them with any valve you know. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

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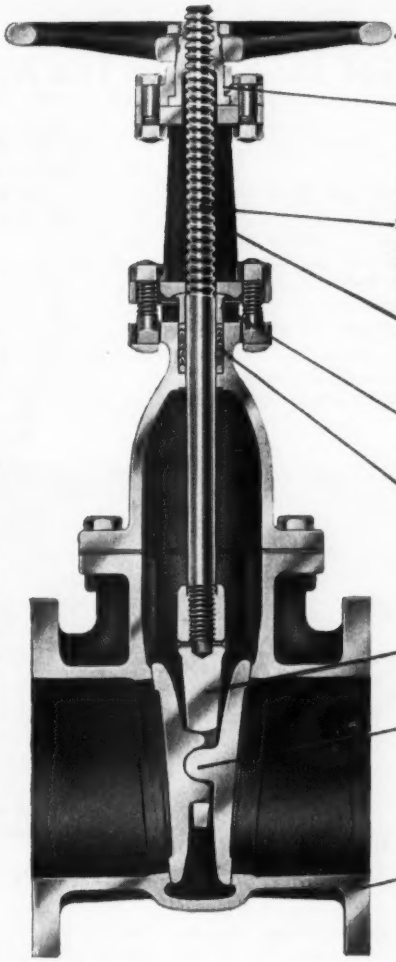

WHEEL of high strength malleable iron designed for firm grip and easy operation.

YOKE BUSHING, easily renewable. Made of bronze, for ideal thread engagement with stainless steel spindle, to prevent seizing or galling of spindle threads. Bushing of stainless steel is optional.

SPINDLE has long thread bearing surfaces with correct lead for easy, tight closing. Screws into wedge carrier, then secured by a stainless steel pin.

YOKE BONNET has liberal space between yoke arms for easy access to packing box. Precision machined flange face assures uniform contact with gasket for a tight body-bonnet joint.

GLAND consists of two pieces — gland flange and gland follower — eliminates binding of follower in case gland bolts are tightened unevenly.

PACKING of Chevron-type Teflon in large packing box prevents leakage. Only a minimum load is required on gland, extending service life of packing.

WEDGE CARRIER connects wedge to spindle and raises or lowers it. Husky in size to stand any operating strains.

SPLIT WEDGE is the ball-and-socket design which automatically adjusts to the tapered seating surfaces for positive shutoff. The discs, revolving freely in the wedge carrier, produce a self-cleaning action on seating surfaces and reduce possibility of galling and seizing.

BODY —Through-port design for full, free flow. Ample wall thickness and good design provide extra strength to withstand stresses. End flanges conform to M.S.S. specs.

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It's 'Ready, Set, Go!' for Soluble Tea Makers

Full field is now set to fight it out in the soluble tea derby which can offer its biggest stakes in the summer season.

Veterans in the race are Nestle Co. (Nestea), and Standard Brands, Inc. (Tenderleaf), both old hands at the instant tea game. But comparative rookies are Lipton, Salada, and Tetley, who are making their initial effort for extensive recognition. Other brands, from trade firms like Tenco Co., will also vie for honors.

While warm weather iced tea sales are a big part of the prize, all entries see year-around consumption of hot tea as the biggest goal. New processes prompt optimistic outlook, and this confidence will be backed up by hefty advertising volume from all stables.

Nestea has the most experience (first start in '48), and Tenderleaf backers point to almost as much. Over the years, Nestea has been fitted to cold water use, and Tenderleaf has also switched to the more versatile soluble.

Seeing institutional as well as retail profits, Lipton ran a healthy trial in several areas last year, but now seeks bigger returns in the national arena. Tetley and Salada, newest two in the race, boast quality processes and sharp merchandising campaigns.

To the winner goes the biggest rewards, but to all go the payoffs of a wider acceptance of soluble tea.

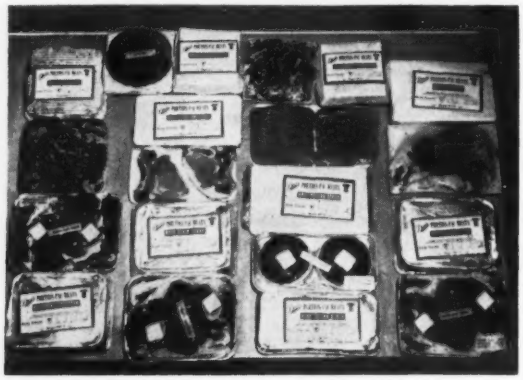
Bag-in-Box Spouts Spout

Handy pour spout that opens into an inner foil-laminated bag is being used for Borden's Starlac and Instant Whipped Potatoes.

Packages from Interstate Folding Box Co., Middletown, Ohio, feature a foil liner tacked to inside of box with the longitudinal seam fin-sealed. Some producers form carton around bag, while others seal bag and carton at same time.

Bag-in-a-box is available to makers of gelatins, pie crust mixes, cake mixes, dehydrated potatoes, etc.

Alcoa is foil supplier. **Circle 402 on Reader Service Card**



Aluminums for Frozen Meats

Frozen meats in cook-in, aluminum foil containers are on the market from Diezi Meat Co., Houston, Texas.

Called portion-pacs, products are available in several container sizes, suitable for broiling.

Rigid material claims advantages over conventional board trays since foil won't stick to meat and have been found useful for storing leftovers.

Bright appearance of foil also enlivens meat-case displays, which have primarily held board-trayed products.

Supplier is Ekco-Alcoa. **Circle 403 on Reader Service Card**

Double Crown Symbol for Minute Maid

First step in overall redesign of Minute Maid canned beverages is introduction of double crown label for new process orange juice.

MM crown, which will be used as a corporate symbol, is intended to strengthen image of Minute Maid as the "king" or orange juice producers.

New can is expected to be in national distribution by June or mid-summer. Conversion of all orange juice to new process is planned for December completion.

Market tested in three areas with good consumer response, can is now available in several major cities.

Jim Nash Assoc. developed design for the Florida firm.

Circle 404 on Reader Service Card

High Fashion Appeal for Salt

A pretty package with a pretty profit is theme of new containers introduced by two major salt producers —Morton and Leslie.

Both have plastic shake-or-pour tops that allow packages to be used as practical and attractive additions to dining table settings.

Leslie's slim, foil-covered, 12-oz. "Finger-Tip Paks" arrive in 4 colors—red, aquamarine, pink, and gold. Each is moisture-proof and holds an average month's supply.

Morton's decorative design of "Table Salters" is an acetate foil and paper combination, created by Forbes Lithograph Co.

Circle 405 on Reader Service Card

GF Adds Instant Soft Drink Mix

Twist, a new instant soft drink mix with Vitamin C added, is being introduced in the Syracuse and Denver markets by Perkins Div., General Foods Corp.

Flavors available are orange, lemon, cherry, and grape, packed in 7-oz. or 14-oz. jars.

Labels vary only with flavor name and feature ice-filled glasses of drink in-use. Large size makes 16 glasses while 7-oz. size serves eight.

Introduction of line is backed by spot TV advertising, Sunday comic ads, and a direct mail consumer coupon offer expected to reach ⅔ of all homes in market areas.

Plastic Carrier for Multipacks

New approach to multipacking features a wrap-around plastic collar and slim, retractable handle.

Advantages offered to manufacturers are high speed processing (1,200 containers/min.), cost saving (approximately 1¢/six-pack), quick product identification, and fast cooling.

Containers may be easily removed and replaced without harm to carrier. Unit stacks quickly on display shelves and has easy disposability for consumers.

Conex Div., Illinois Tool Works, is supplier.

Circle 406 on Reader Service Card

FLUIDICS* AT WORK

From mite to mighty... fill them all with Pfaudler fillers

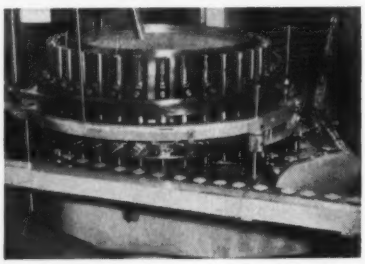
Whatever size your container . . . #211 x 101.5 can or gallon; whatever your product . . . a spread like deviled ham or lightly fluid antifreeze, a Pfaudler rotary piston filler will handle it for you fast, at low cost and without spill.

The Wm. Underwood Co. at Watertown, Massachusetts, uses a Pfaudler RP-35 filler to package over 500 cans of viscous deviled ham a minute. Accuracy is held to ±1/10 fluid ounce—thus cans come off the filler clean.

A Southwestern petroleum manufacturer fills antifreeze at 60 to 80 *gallon* cans a minute using a seven-station Pfaudler machine. Similar results are common in citrus, soup, syrup and evaporated milk plants.

Simplicity of design is the all-important characteristic of Pfaudler fillers. Low maintenance—only four primary wearing parts. Fast cleaning—one man does a thorough job in just 30 minutes. High accuracy—precision adjustment even at full operating speeds. No product loss . . . positive acting no can no fill mechanism.

For more information, write to our Pfaudler Division, Dept. FE-50, Rochester 3, New York. Or contact your Pfaudler representative.



Underwood Deviled Ham is filled at a rate of over 500 cpm, using this Pfaudler 35-station rotary piston filler.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

New Product Shorts

Flavored Ice confections bidding for summer sales are Minute Maid "Push-Up" Orange Bars, General Foods' orange, lemon-lime, cherry, and grape "Kool Pops," "Lik Cicles," from Beverly-Franilla Corp., and DCA Food Industries' "Gold Mine Icicles."

Frozen Zucchini Squash is being marketed nationally under "Queen's Delight" brand, Artichoke Industries, Castroville, Calif.

Shrimp Curry, solely a Stouffer Restaurant item, until now, is in supermarkets from parent firm.

Chocolate Puffs, flavored marshmallows, are being introduced by Doumak, Inc., Los Angeles.

All Butter Yellow Cake with Chocolate Fudge Icing, and All Butter Chocolate Cake with Chocolate Icing are latest from Kitchens of Sara Lee, Inc.

Cornette, margarine with liquid corn oil, and Instant Bosco, chocolate drink mix and topping, are being tested by Corn Products Co.

Barbecue Sauce introduction by Kraft Foods will have heavy advertising backing.

Campbell Soup Co. has introduced new 15½-oz. can for Franco-American Spaghetti Sauces, but will also continue the 10¾-oz. size.

Both Onion and Pizza Dip-Mixes from Bel-Air Food Products are now in national distribution, following successful market tests.

Wisconsin Natural Cheddar Cheese, a canned coffee ring, a 9-oz. instant coffee jar, and a 16-serving package of instant whipped potatoes are announced by Borden Foods.

Packaging Briefs

Hot Soups in hermetically sealed aluminum foil containers (Alcoa) are being introduced for vending machine use by Rudd-Melikian Co., Hatboro, Pa. (407)

Aluminum eggbox for maximum carton protection is available from Nestaway, Inc. (408)

Coding device used for Heinz baby food jars prints information and three parallel bars on cap. Bars provide tamper-proof assurance to customer. Alcoa is supplier. (409)

HiYield Printkote with coated surface recommended for printing has been developed by West Virginia Pulp & Paper Co. Board is expected to enable non-virgin fibre users to switch to 100% virgin bleached type. More cartons per ton makes it comparably priced with lower grades. (410)

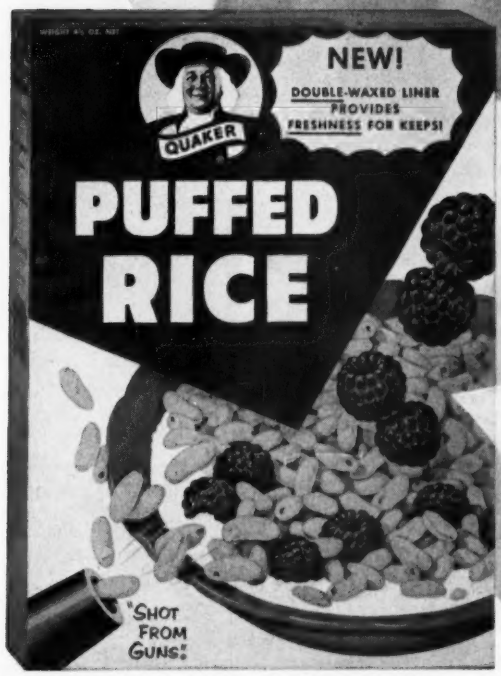
Package Testing is now being done by American Laboratories, Fullerton, Calif. (411)

Just Between You and Your Customer

Customer loyalty is your most valuable business asset. One of the custodians of this loyalty is your package, and the product protection it provides.

Here's where Riegel can help, through research, development and manufacture of packaging materials . . . tailor-made for your product . . . with equal emphasis on protection, low cost, high packaging speed and attractive appearance. More than 600 different materials to choose from . . . papers, paperboards, foils, films and combinations . . . waxed, coated, printed and plain . . . tailor-made or standard.

Write to Riegel Paper Corporation, 260 Madison Avenue, New York 16, N. Y.



Quaker Puffed Rice is protected with a special Riegel laminated and over-waxed Cereal Liner. Run at high-speed on Pneumatic Scale equipment.

Riegel

PROTECTIVE PACKAGING MATERIALS

Members of the Food and Beverage Technical Service "team" shown here (l. to r.) are: Charles Feldberg, Dr. Rouben Kachikian, Joan Griffin, Everett Macdonough—Manager, John Geminder, Edward O'Neill.

PRODUCTS FOR THE FOOD INDUSTRY

1

BEVERAGE

Sodium Citrate, Sorbistat®-K (Potassium Sorbate), Calcium Cyclamate, Sodium Benzoate, Citric Acid, Tartaric Acid, Caffeine, Ascorbic Acid, Erythorbic Acid, (Isoascorbic Acid)

2

MEAT PACKING

Erythorbic Acid (Isoascorbic Acid), Sodium Erythorbate (Sodium Isoascorbate), Ascorbic Acid, Sodium Ascorbate, Citric Acid, Biostat®-PA (Oxytetracycline), Sodium Citrate

3

MILLING & BAKING

Bi-Cap® (flour enrichment mixtures)

L-Lysine, Glucono-Delta-Lactone, Tartaric Acid, Cream of Tartar, Citric Acid, Sorbistat® (Sorbic Acid), Sorbistat®-K (Potassium Sorbate), Sodium Benzoate, B Vitamins, Sol-U-Pak* *T.M.

4

CANNING & PRESERVING

Ascorbic Acid, Citric Acid, Sodium Citrate, Calcium Cyclamate, Sodium Benzoate, Tartaric Acid

Science for the world's well-being

Chas. Pfizer & Co., Inc., Chemical Sales Div., 630 Flushing Ave., Bklyn. 6, N.Y. Branch Offices: Clifton, N.J.;

Yours, from Pfizer...
HIGHEST QUALITY
FOOD INGREDIENTS
PLUS

PFIZER TECHNICAL SERVICE

(an invaluable asset)

"Quality" and "Pfizer Products" have been synonymous for over 110 years. This reputation results, in no small way, from the contributions of Pfizer Technical Service. This "helping hand" to our customers is available at every stage of product development. It is working proof of the Pfizer belief that a chemical manufacturer's responsibility extends beyond the point of making a sale.

For instance, baked goods manufacturers wanted a more controlled type of leavening action for the new "convenience" foods such as cake, general purpose, and specialty mixes. Pfizer developed Glucono-Delta-Lactone, a chemical leavening acid that imparts no unpleasant aftertaste, yet gives products excellent volume and fine even texture. In addition, G-D-L's low level of activity in storage insures longer shelf life.

When mold and yeast growth caused food freshness problems in cheese, wines, prepared salads, baked goods, etc., Pfizer Sorbistat®-K and Sorbistat® provided the means for ensuring that these products truly "stay fresher longer."

In the nutritional area, Pfizer L-Lysine has made possible great strides in improving the protein quality of foods ranging from breads to breakfast cereals...without affecting the taste or texture of the product. This essential amino acid "activates" the protein present, thus improving the total protein quality.

These are a few examples of how any Pfizer customer may benefit from our program of product assistance.

Pfizer

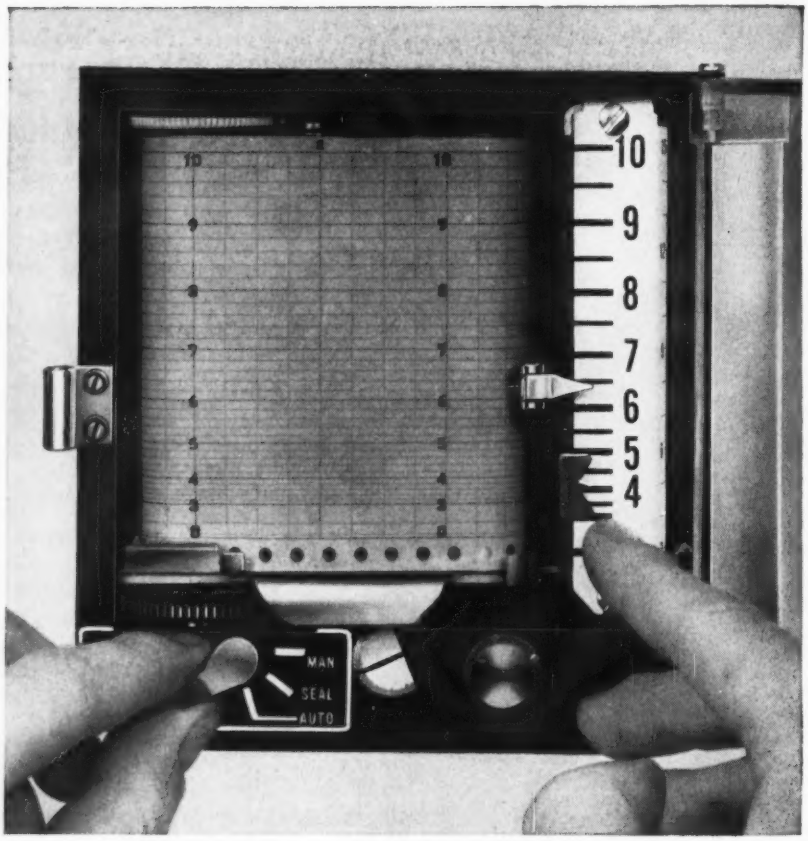
Why not put the Pfizer team to work for you?

5	6	7	8	9
FROZEN FOOD	**DAIRY**	**OIL AND FAT PRODUCTS**	**DESSERT**	**CANDY**
Citric Acid, Ascorbic Acid, A-C-M®	Citric Acid, Sodium Citrate, Vitamin A, Sorbistat® (Sorbic Acid), Sorbistat®-K (Potassium Sorbate), Vitamin A Palmilets* Types M & W *T.M.	Vitamin A & D, Beta Carotene, Citric Acid, Sodium Benzoate	Citric Acid, Sodium Citrate, Fumaric Acid, Ascorbic Acid, Calcium Cyclamate, Calcium Gluconate, Sorbistat® (Sorbic Acid), Sorbistat®-K (Potassium Sorbate)	Citric Acid, Calcium Cyclamate, Ascorbic Acid, Tartaric Acid, Cream of Tartar, Sorbistat® (Sorbic Acid)

Chicago, Ill.; San Francisco, Cal.; Vernon, Cal.; Atlanta, Ga.; Dallas, Tex.; Montreal, Can.

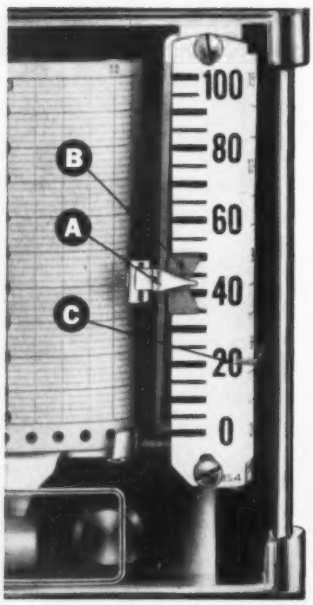
Quality Ingredients for the Food Industry for Over a Century

One of 38 Metagraphic Receiver Models you can choose from, all with only 5" x 5⅛" panel. This model has single-knob, six-position transfer station for completely "bumpless transfer" in cascaded control systems.



BRISTOL METAGRAPHIC RECEIVERS:

"Easiest 'bumpless transfer' you ever saw"



Variable (A), set point (B), and valve position (C), all on same scale, make manual-automatic transfer easy.

That's what instrument men say after trying the Bristol Metagraphic Pneumatic Receiver—even in cascade control systems.

Just seal, match pointers, transfer. There's not a single value to read. That's because the Metagraphic gives you valve position, set point and measured variable —*all on the same scale.*

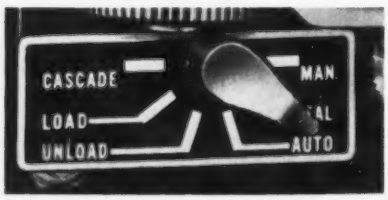
No finger-disconnects here! The Metagraphic is a true plug-in receiver—plugs and unplugs in 5 seconds with no loss of automatic control.

You can switch from indicator to recorder in less than 10 seconds, interchange many receiver models, change range simply by changing chart. Cuts down on costly reinstallations if process requirements are changed.

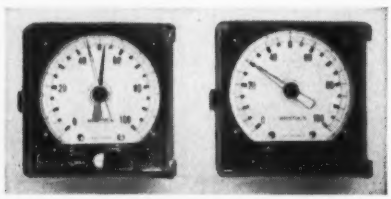
Write today for the complete Metagraphic story. Don't forget, Bristol offers the widest selection of miniatures on the market. (Full sized instruments, too.) The Bristol Company, 115 Bristol Road, Waterbury 20, Conn. B-18

BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



Six-position transfer station (enlarged view) for cascade service. Three-position manual-automatic station is also available.



Metagraphic Indicating Receivers have full 9-inch scale for easy reading; feature complete 10-second interchangeability with recorders.

Where Do You Stand in Progress Picture?

It's exciting to take the pulse of industry, and to put the finger on plans to invest in the future.

Such a pulse-taking survey has just been completed by McGraw-Hill's Department of Economics. The score for our industry reflects strength, and points to tougher food competition. But it falls far short of that for "all manufacturing." And food companies are competing with other industries for consumer dollars.

69% of capital investment is for efficiency

Manufacturers as a whole plan a 26% increase in capital expenditures this year—for a total of over $15 billion. Our industry will lay out only 6% more than last year, or $874, million. Of this, $241 million will be in the beverage branch, an increase of 19%. Some $633 million will be spent by other types of food firms, a mere 2% boost over '59.

With food factories operating at 83% of capacity, against a preferred rate of 93, the emphasis is on modernization. No less than 69% will be spent in this way, compared to 31% for expansion.

Are you keeping up with the industry in investing in production efficiency? On the average, more than half of all food plant equipment is obsolete. How much of yours has been around 10 years or more?

Index of capacity in the food industry increased from 104 in '51 to 143 last year. Is expected to gain another 6% this year and 15% through '63. Running way ahead of population gain, this puts companies on their sales mettle to keep plants busy. And break-even points run high.

Inasmuch as modernization is outpacing expansion, our industry plans to put 75% of its money into equipment, and only 25% into buildings. A sensible arrangement. Yet it pays to replace buildings so old that they are costly to keep sanitary, or so poorly arranged as to hamper efficiency.

Sales expectations pretty well parallel gain in capacity—a 5% rise in physical volume this year and 16% through '63. And in '63, the industry anticipates that 8% of sales will be in new products. In fact, 14% of firms report that a significant share of capital spending will go for new product facilities.

Tips to marketing aims are the areas in which our industry is making most of its capital expenditures this year. North Central leads, with 41%. Then come the West, 18%; Middle Atlantic, 16%; South, 12%; South Atlantic, 9%; and New England, 4%. These percentages are related to population changes, buying power, and distribution efficiency.

R & D money up 14%, but still low

In this era of progress built on research, it is significant that the food industry plans to boost R & D expenditures by 14% this year, to $110.8 million—and to $140.7 million by '63. How do your plans compare with this trend? Research is insurance that you stay in business.

It is truly sad, however, to consider that '60 R & D expenditures will amount to only 0.2% of food manufacturers' sales. And the outlay for research facilities will be a paltry $29 million this year.

In R & D budgets, 52% of food and beverage firms relate them to new products plans, 21% to sales, 12% to profits, 3% to capital investment, and 12% to "other". The majority take a sensible approach.

No less than 93% spend practically all depreciation allowances for new plants and equipment, commendably topping all other industries in this respect. Such allowances amount to $739 million for '59; $887 for '63.

There you have the picture of planned progress. If your company is on the ball, it will paint one still brighter than the average.

NOW— THE FIRST GLASS ENCLOSED SANITARY HIGH SPEED LINE FOR PRESSURIZED FOOD PRODUCTS . . .

An all-stainless-steel line for loading pressurized food products in aerosol containers under sanitary conditions is now in operation at Stalfort's modern Pressure-Pak plant. Completely segregated in a glass-enclosed area, this line is dismantled and sterilized before and after each production day. Any food product suitable for aerosol dispensing, even powder, can be economically handled in this area.

Three other high-speed lines are available for loading metal or glass aerosol containers that do not require completely sanitary conditions.

Stalfort, the country's largest filler, can also load liquids, waxes, or creams in conventional glass or metal containers.

JOHN C. STALFORT & SONS, INC.

Established in 1868

321 W. Pratt Street, Baltimore 1, Md.

Recent Economic Growth — The Numbers Game

If it truly portrayed recent rates of economic growth in the United States, the report on employment, growth and price levels recently issued by the staff of the Joint (Congressional) Economic Committee would point up scarcely less than a national disaster. Among other things, it would document impressively Premier Khrushchev's crack that "the capitalist steed the United States is riding . . . is worn out."

One of the major findings of the Joint Committee's staff (in the Eckstein Report, named for its staff director Otto Eckstein) is that between 1953 and 1959 the average rate of growth of physical output in the United States was only 2.4 per cent per year. This is scarcely more than half the average annual rate of growth of 4.6 per cent the staff found to have prevailed between 1947 and 1953.

Happily, however, the report does not reflect the basic economic realities. Its finding on relative rates of economic growth for the two periods is a statistical *tour de force* which, by the selection of certain figures and certain dates, distorts the record of America's long-term economic growth.

Playing The Numbers Game

By the selection of appropriate starting and terminal periods it is possible to document almost any rate of economic growth that is desired. The table at the bottom of this page shows you how this can be done. It will also show you how the Eckstein staff worked out its shocking contrast in growth rates. The table is built like a schedule of airplane fares between different cities. The postwar years 1946 through 1959 are put down on two axes. One runs down the left hand column, the other runs across the top of the table. Put your finger on the point where the two axes intersect and you have the average rate of growth for the period covered.

ANNUAL AVERAGE GROWTH RATES OF THE U.S. ECONOMY, 1946-1959*

(Percent increases, starting year to terminal year, of GNP in 1954 dollars).

Starting Year \ Terminal Year	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
1946	X	–0.1	–1.9	–1.2	3.0	3.9	3.8	3.9	3.2	3.7	3.6	3.4	2.9	3.2
1947	X	X	3.8	1.8	4.1	4.9	4.6	4.6	3.7	4.2	4.0	3.8	3.2	3.5
1948	X	X	X	–0.1	4.2	5.3	4.8	4.7	3.6	4.3	4.0	3.8	3.1	3.4
1949	X	X	X	X	8.7	8.1	6.5	6.0	4.4	5.0	4.6	4.2	3.5	3.8
1950	X	X	X	X	X	7.4	5.4	5.1	3.4	4.3	3.9	3.6	2.9	3.3
1951	X	X	X	X	X	X	3.4	3.9	2.0	3.5	3.2	3.0	2.2	2.8
1952	X	X	X	X	X	X	X	4.4	1.3	3.6	3.2	2.9	2.0	2.6
1953	X	X	X	X	X	X	X	X	–1.6	3.2	2.8	2.6	1.6	2.4
1954	X	X	X	X	X	X	X	X	X	8.1	5.1	4.0	2.4	3.2
1955	X	X	X	X	X	X	X	X	X	X	2.1	2.0	0.5	2.0
1956	X	X	X	X	X	X	X	X	X	X	X	1.8	–0.2	2.0
1957	X	X	X	X	X	X	X	X	X	X	X	X	–2.3	2.0
1958	X	X	X	X	X	X	X	X	X	X	X	X	X	7.0
1959														

*Compound rates of growth

Following this procedure, you can find growth rates ranging all the way from —2.3 per cent, between 1957 and 1958, to +8.7 per cent, between 1949 and 1950, along with almost any other rate you would choose for various years and sequences of several years over the postwar period.

For example, if you want to demonstrate that the postwar growth rate through 1953 was less than 4% per year, you take off from 1946, include a drop of 0.1 per cent between 1946 and 1947, and come up with a growth rate for the 1946-1953 period of 3.9 per cent. But if you want to show it was quite high, you take off a year later, from 1947 (which drops out that dismal —0.1 per cent for 1947) and come up with a fine growth rate of 4.6 per cent for the 1947-1953 years.

Statistical Hocus-Pocus

That's what the Eckstein staff did. It took off at one end from a year when there was just about no growth, went to the Korean War boom year of 1953 at the other end, and got that average growth rate of 4.6 per cent. Then it took off from the Korean War boom year of 1953 and ran to the year 1959, when business was recovering from a recession and suffered through a steel strike of 116 days, to come up with its 2.4 per cent growth rate for the second postwar period. As the table indicates, by taking off a year later (1954) the average growth rate would have become 3.2 per cent, and if the take off had been 1949 it would have been 3.8 per cent.

There are those who, in nontechnical terms, would characterize this as statistical hocus-pocus. There are also those who would see in it an element of political hocus-pocus, too. This is because the years 1947-53, when the Eckstein staff found there had been the healthy 4.6 per cent growth rate, were roughly years when we had a Democratic president, while the anemic growth rate of 2.4 per cent it calculated for the subsequent years was for years of a Republican presidency.

Actually it can be shown that the civilian part of our economy has had more rapid growth during the Republican administration than it had during the Democratic years. If military expenditures are subtracted from the national ouput, the resulting growth rate for 1953 to 1959 is slightly higher than for 1947 to 1953.

However, we do not question the *bona fides* of the Eckstein staff. **But we do assert that it has produced a statistical picture of the postwar growth of the American economy which is dangerously misleading both at home and abroad.**

Abroad, the report appears to give official documentation to the propaganda line that the Soviet economy is running rings around the U.S. economy in growth, and that it is Communism a country should choose if it really wants to develop rapidly. Building on a much smaller economic base than the U.S.A., the Soviet Union — as well as almost every less advanced nation in the world — is bound to show a larger percentage increase in output than the U.S.A. But the Eckstein staff calculation gives the Communists ammunition they don't deserve.

Are We Facing A Crisis?

The contrast drawn by the Joint Committee staff in postwar U.S. growth rates suggests that we are facing scarcely less than a crisis through paralysis of our economic growth which calls for drastic remedies. But this, as the full 1947 to 1959 growth record set forth in the table makes clear, is very definitely not the case. Our over-all postwar rate of growth, as measured by the gross national product in physical terms, has been 3.5 per cent per year, a rate nearly double the long-term growth rate of 2 per cent per year between 1909 and 1939. In the continuing fluctuations in the rate of growth which more or less inevitably characterize a relatively free economy, we have had some downs in recent years. **But our economy is now on the upbeat again. And at the end of this year, the U.S. economic growth rate for the postwar period can be expected to be 3.7 per cent per year.**

It is extremely important for the United States to continue to maintain this rate of economic growth or even to surpass it. Upon this effort depends our capacity to meet our defense requirements without dangerous strain, to provide an adequate margin for foreign aid, to improve our own productive facilities, and to continue to raise our own standard of living.

How not only to maintain but possibly improve upon our postwar pace of economic growth will be the subject of strenuous debate in the months ahead. However, the debate will have a much better chance of being constructive if the postwar growth record is seen in proper perspective. To this end one of the first things to do is to junk panic rousing statistical portrayals such as that in the Eckstein report.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

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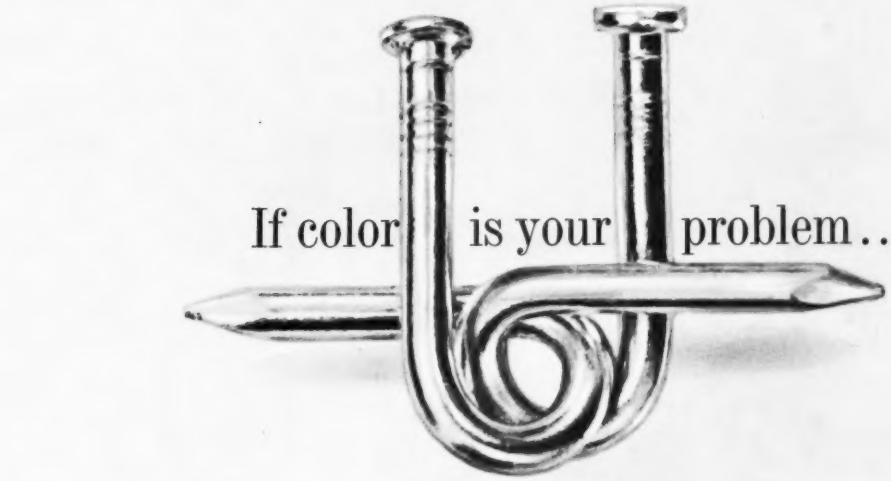

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First producers of certified colors. 161 Ave. of the Americas, New York 13; 11-13 E. Illinois St., Chicago 11; 2632 E. 54 St., Huntington Park, Calif. In Canada: Stuart Bros. Ltd., Montreal, Toronto, Winnipeg & Vancouver.

The more you can see through 'em—the faster you'll sell 'em

Filter edible oils with Celite filter aids

IN THIS ERA of self-service, clarity and sparkling brightness have become synonymous with flavor—in the shopper's mind's eye!

No matter what type of edible oil you're processing, you'll be sure of the clarity and sparkling brilliance your customers look for with Celite* filter aids. Every cubic inch of these diatomite particles presents over 5,000,000 microscopic "filters" to passing fluids . . . removes the most minute solids and colloidal matter which could otherwise affect clarity or shorten shelf life. And for any degree of clarity desired, Celite gives the fastest flow rates obtainable.

Many food technologists have found that the quickest and easiest way to solve a filtration problem is to call a nearby Celite field engineer. He can tell you which of the many Celite grades will best meet your needs. Why not call today for a no-obligation analysis of your filtration operations? Or write to Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

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A NEW HIGH...IN VALUE
A NEW LOOK...IN STYLING
A NEW LOW ...IN PRICE

AUTOMATIC'S Gas Operated LIFT TRUCKS

VALUE PLUS—Automatic's simplified power package offers the ultimate in high operating efficiency, low cost of operation, and maximum safety. A gas engine and variable voltage generator, precisely matched, supply exact power to the electric drive motor...no clutch or hydraulic torque converter to cause trouble or worries. Here are a few of Automatic's plus value features:

- Operates on 25 to 30% less fuel
- 50% longer hydraulic pump life
- Oversize brakes last up to 30% longer and are adjustable without removing wheels
- Longer-life, advanced-design roller mounted uprights
- Ventilated exhaust dispels fumes
- New 3-way adjustable seat increases driver efficiency—reduces fatigue

MODERN STYLING—New orange and blue color combination. Automatic's new special high visibility safety orange adds another safety plus feature to your plant, while its new royal blue color accentuates the truck's low center of gravity and high stability.

THE PRICE IS RIGHT—No longer a premium-priced truck, but priced competitively with trucks which use hydraulic torque converters.

CAPACITIES: ▲
3,000 to 10,000 lbs. with cushion tires.

CAPACITIES: ▶
3,000 to 8,000 lbs. with pneumatic tires.

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The Importance of Logic in Packaging Machine Design.

The most successful packaging machine is the most simple in concept. Unnecessary complexity invariably taxes itself in speed, performance, efficiency and maintenance.

Triangle originally entered the bag making, filling and sealing field to develop a single tube machine. No other consideration was allowed to complicate the basic requirements. That's why Triangle's single tube machine has been so unusually successful.

What could be a more logical starting place for developing a multi-tube bag maker, filler and sealer . . . ?

NOW TRIANGLE MORE THAN DOUBLES THE ADVANTAGE OF ITS REMARKABLE BAG MAKER, FILLER AND SEALER!

Regardless of whose equipment you're using or whether you're presently considering equipment purchase, you owe it to yourself to investigate the new Triangle Twin machine. The reason? It has all of the advantages, all of the flexibility, all of the efficiency our single tube equipment has without any of the disadvantages common to all other dual tube machines.

Briefly, Here's Why . . .

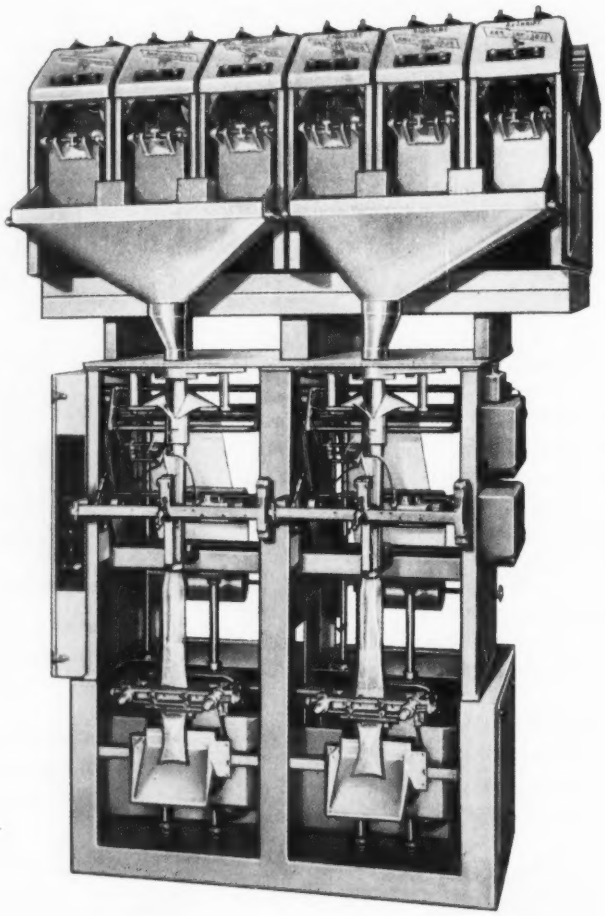
The Triangle Twin is fast . . . 120 bags per minute with any bag material (90 per minute with polyethylene). It will handle a full range of bag sizes up to 8″ x 16″.

The Triangle Twin is a fully integrated combination of two, efficient single tube machines with one common drive . . . yet sealing jaws operate independently to permit one side to operate while the other side is down for film threading or routine maintenance. This feature results in *less* downtime and more production than normally expected.

The Triangle Twin mounts up to *six* Elec-Tri-Pak net weighing scales on top where they belong. No costly intermediate elevator feed is required. Volumetric filler and other synchronized systems are also available.

The Triangle Twin has all the performance of the time proven single tube bag maker and filler . . . fast, simple changeover for all materials from cellophane to polyethylene . . . quick return jaw assembly . . . simple, functional design of sealing jaws. . .

See for yourself how far the Triangle Twin has advanced the concept of high speed bag making, filling and sealing. Write today—without obligation, of course.



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Army's New Food-Raying Salient Mapped by 6-Yr. Breakdown of R&D Budgets

	Fiscal Years					
	'61	'62	'63	'64	'65	'66
Military Applications & Economic Analyses	.....	.....	.....	.....	$50,000	.....
Assurance of Wholesomeness	$300,000	$250,000	$200,000	$100,000	$50,000	$50,000
Pre- & Post-Irradiation Studies	340,000	340,000	340,000	440,000	320,000	250,000
Destruction of Micro-organisms	90,000	80,000	60,000	50,000	25,000	25,000
Nuclear Effects on Foods	40,000	40,000	40,000	40,000	.....	.....
Acceptance Testing	.....	.....	.....	35,000	60,000	60,000
Packaging Studies	50,000	50,000	50,000	100,000	75,000	50,000
Radiation Services	180,000	180,000	180,000	180,000	180,000	180,000
Totals	**$1,000,000**	**$940,000**	**$870,000**	**$945,000**	**$760,000**	**$615,000**

FOOD ENGINEERING

Army & AEC Revive Food Radiation Research

THE ARMY has taken a new, though less ambitious, start on a radiation-preservation food program.

This time, it will go into basic research seeking definite demonstration that ray-treated foods can be both wholesome and tasteful.

The new project replaces an earlier, full-blown construction program that was scrapped (FE Nov. '59, p. 21). Called for in this prior—but now aborted—plan was a major $7.5-million ionizing radiation production plant at Lathrop, Calif. Here, a processing-line setup had been envisioned for sterilizing 1,500 lb./hr. of meat.

In contrast, the chief objective of the new program is to obtain wholesomeness clearances permitting unrestricted use of ray-preserved food.

Evidence of certain health problems associated with consumption of rayed foods was a big reason for cancellation of the Lathrop project.

In the latest hearings, however, spokesmen for the Army's Surgeon General said that congenital blindness and hemorrhagic syndromes observed in experiments on animals—at first thought caused by a diet of rayed milk and meats—had been resolved after vitamin K was added to the test animals' diet.

As a part of the new program, the Surgeon General's staff will conduct the largest experimental animal feeding operation yet undertaken to determine wholesomeness of certain food items. Some 250,000 animals, principally dogs and rats, already have figured in rayed-food tests.

First results indicate that some animal anomalies remain to be resolved. In certain cases, for instance, rupture of the left auricle has been observed in the hearts of 30-50% of mice fed rayed foods. In other experiments, a rayed diet has caused sterility in dogs.

Lack of crystal-clear explanations relieving radiation as a possible cause of such effects has, up to now, forestalled the Surgeon General's recommending a short-term feeding program for humans.

The Army's program, entailing work on both low-dose (pasteurization) and high-dose (sterilization) treatment of foods, will also develop procedures for improving taste, appearance, and odor of rayed foods. Relative to troop acceptability of high-dose treated foods, work will particularly center on beef, pork, smoked ham, and chicken. Other items of military-ration importance, primarily fish and fruit, will be included in the low-dose research.

QMC will continue to handle the food irradiation program for the Army. On this score, Deputy Quartermaster General C. C. Calloway cites QM recommendations for locating all irradiated food research facilities at the R&D Command in Natick, Mass.

Calloway noted that it would make sense, in this connection, to centralize QM research labs at Natick, which would mean moving two lab facilities from Chicago's Food & Container Institute.

Army R&D Chief Richard Morse promises that, as the research program progresses, steps will be taken to encourage the earliest possible commercial entry into the production of irradiated foods.

The operations will also be closely tied to the separate programs of the civilian government agencies, including the Atomic Energy Commission.

AEC's Low-Beaming

AEC witnesses estimated the Commission's fiscal '61 expenditure at $500,000 on low-dose research.

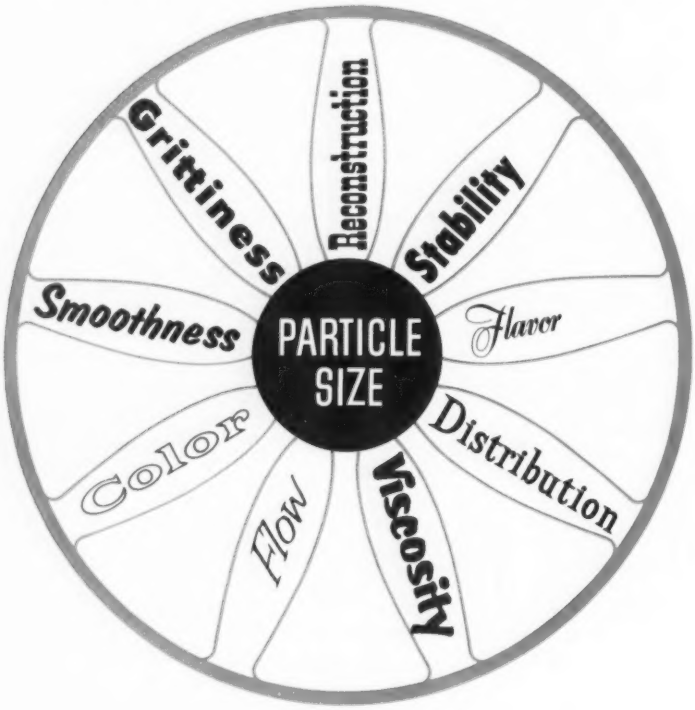
In cooperation with the nine-agency Inter-Departmental Committee on Radiation Preservation of Food, AEC would study specific items, accenting fish and fruit. Sought would be promising economic applications in industrial processing and marketing. —*End*

RICHARD SMITH
McGraw-Hill News Bureau, Washington, D.C.

Outlays for Army Center
(Fiscal '61 Budget)

Food-Preparation Facility	$300,000
Electron Accelerator	400,000
Cobalt-60 Irradiator	1,100,000
Total	**$1,800,000**

Your Particle-Size "Progress Wheel" Rolls on Nine Spokes



REPRESENTED here are the basic factors to be "worked together" for solving nagging day-to-day production and quality control problems.

Here's How to Clinch Vital

Sharp closeup shows how to handle factor's critical effect on color, taste, viscosity, and stability of your food products . . . New electronic measuring unit streamlines checking and regulating procedures

NO MATTER which angle or aspect you take, you'll find particle size of No. 1 importance in your food picture.

It's a primary consideration in the manufacture of just about all foods—not only in the finished products but also in the basic ingredients.

The big factor is how particle size correlates with quality and performance of a product. Knowing the content of particles (and their distribution), a processor can more uniformly control such things as color, flavor, texture, consistency, and shelf-life.

ROBERT H. BERG
and GEORGE M. KOVAC

Coulter Industrial Sales Co., Elmhurst, Ill., and Consultant, Chicago

It's here that a new electronic device, the Coulter counter, is seen rendering a much-needed service.

Those using it cite these gains:

Speed: Ten-point size-distribution data routinely obtained within 10 min. Method fast enough for on-stream control of certain processes.

Accuracy: Provides statistically sound data, is sensitive (immune to particle shape or density), and minimizes human error.

Range: Total swing covers particles 0.25-300 microns (and up).

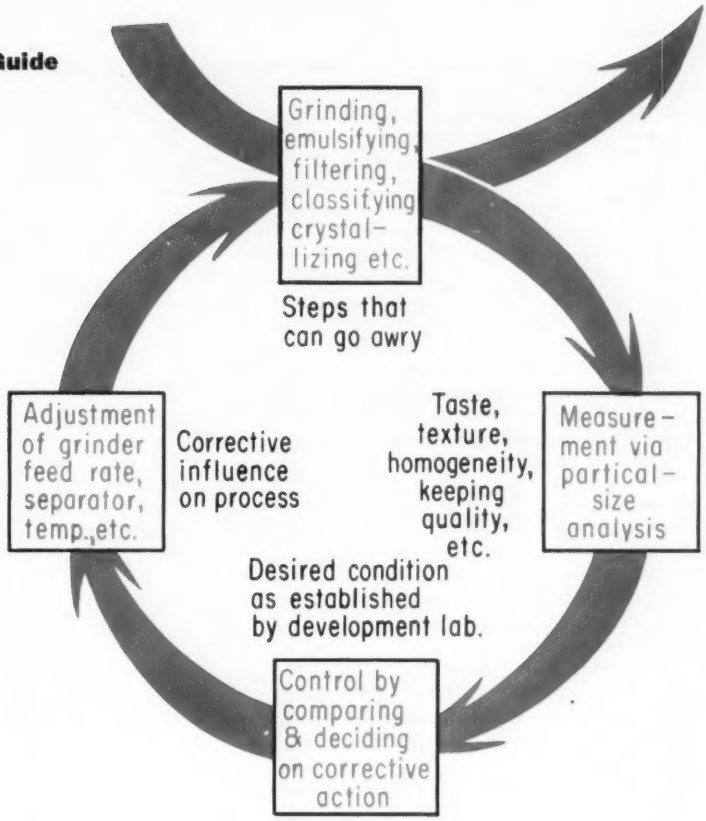
Versatility: Almost any type product can be measured in dry or liquid foods. Principle adaptable to continuous on-stream sampling, with various modes of data presentation (tape recording, multiple channel read-out, and continuous recording of count ratios and fractions).

Reliability: Good measurements, with no fatigue in operations and readings easily checked by oscilloscope's display of distribution, aperture observation with microscope, and uniformity of counting rate.

But before detailing the new counter, let us consider the unit operations in which particle sizes are significant:

1. **Size reduction,** involving crushing, grinding, rolling, comminuting, and emulsifying. Materials have different grinding characteristics due to their friability, plasticity, cleavage planes, crystalline structure, etc.
2. **Size classifying.** This covers sifting, screening, filtering, and even dust collecting or grading (classifying on a larger scale).
3. **Size growing,** as in crystallizing sugars or salt, agglomerating certain

Feedback Control Loop is Guide


Grinding, emulsifying, filtering, classifying crystal-lizing etc.
Steps that can go awry
Measure-ment via partical-size analysis
Taste, texture, homogeneity, keeping quality, etc.
Desired condition as established by development lab.
Control by comparing & deciding on corrective action
Adjustment of grinder feed rate, separator, temp., etc.
Corrective influence on process

BY MEASURING size of particles discharged from "size reducers" and comparing with an established size level, you can (with the "particle pulses") automatically adjust your process machines. In so doing, you will produce particles of more uniform size that will aid quality control.

Particle-Size Control

products, formation of milk stones in evaporated milk, and even budding of yeast (to ferment beers).

Particle size also has an important bearing on natural processes relating to air pollution, water contamination, and status of fruit or vegetable cells. Regarding the latter, biologists have found a correlation between an apple's cell size and its eating qualities.

Focus on Factors

Size is related to a product's color, adsorptivity, grindability, filterability. It affects taste of coffee, chocolate, peanut butter, etc. Hence, these relationships are the ultimate objective of fine particle studies.

Let's sum up the importance of particle size by pointing out examples—

Color: The size and shape of a product's particles influence its color. In fact, color can be enriched if particle shape and size are uniform. And, through particle-size control, certain color wavelength bands can be blocked out in flavor of a specific band like red or yellow.

Too many fines may give a flat pasty appearance. In making a tomato soup using crackermeal filler, for example, a meal with too many fines gives the soup a flat almost white look. And large size particles will give it a mottled appearance. But if there's uniform distribution of particle size, the soup will have a brilliant red color.

Shape, as we've pointed out, influences a product's color. Random pieces won't control light reflection as will laminar-shaped particles.

Taste: Measuring particle size by sieving doesn't work in certain cases, especially where a product's grittiness is concerned. Grittiness must be avoided in cocoa powders (for coatings), sugars (for icings), confections, etc.

Needed here is a stereo-microscopic check on a particle's 3-dimensional shape. Physical makeup of certain materials makes it difficult to control particle shape during size reduction. In such cases, a material's cleavage plane precludes any control of particle shape during reduction. For example, certain crystals retain their same crystalline shape during grinding.

Another reason sieving may be inadequate is the elongated "toothpick-like" shapes (like wheat hulls) that may pass through screens of a given mesh size. And when they do, a product's color, taste, or cooking time may be adversely affected.

Moreover, different size-reduction machines produce particles of different shapes and yet of the same size. This, of course, is of vital concern to the equipment manufacturer. Food industry's concern, however, is what these shapes mean to his products.

Spice makers know that proper size reduction (100-400 mesh) will enhance flavor level, even to such an extent that spice additions may have to be cut back. The finer the grind, of course, the more area is exposed for maximum release of natural flavor. Finer-grind spices also blend more readily with products. *(Continued on next page)*

As a practical consideration, the food manufacturer may find it highly advantageous to include particle size in his purchasing specifications. This way, he eliminates variations in flavors.

Viscosity: By controlling particle size, it's possible to make a thin soup viscous and more full-bodied without adding gelling agents. Example is a soup with beef or vegetable stock. When run through a size-reduction machine free liquid will combine with solids being reduced, and soup will become viscous. But if you go too far, particle size will become so small that the soup will be thin.

Ketchup, too. Here, color can be enhanced and quality upgraded by controlled size reduction. Consistency can also be controlled without the use of thickening agents. You get a redder looking ketchup by releasing colorless water impacted in the fibrous solids.

Product stability: Separation of baby foods can be avoided, also cocoa particles in chocolate-milk drinks. Same is true with frozen juice concentrates, soups, salad dressing, mustard, and coffee. You'll get "mud" on the bottom of your cup of coffee if there are more than 1% particles below a 100-mesh size (150 microns).

Reconstitution: Powdered milk is extremely difficult to reconstitute. But when milk solids are processed into porous granules, reconstituting is easy—the liquid readily flowing into solids' pores.

Tomato solids with too many fines will float, won't wet out. Only by running the slurry through a mill can the solid size be reduced to form a uniform, viscous, reconstituted product.

Effects on Processes

Particle size has a direct bearing on how certain manufacturing operations are carried out. Size measurements tell if a process is on the beam, and how to correct it if it's not.

Uniform cooks and shorter cooking time are accomplished when particle sizes are known. Depending on size, particles may be over or under-cooked. Charring of particles can be eliminated by thoroughly wetting solids before cooking.

The manner in which vanilla beans are size-reduced will affect flavor-extraction time as well as amount of flavor extracted. By using the shearing principle involved in impact-in-air comminution (instead of shearing action with a guillotine), you'll end up with the same size pieces but with open (rather than sealed) ends for maximum menstrum action.

Particle size is extremely pertinent in preparation of cake mixes. Otherwise, ingredients like cocoa powder, shortening, and spices, won't be uniformly distributed. Here, the consumer is likely to end up with non-uniform results, and the manufacturer with complaints.

In brewing, it's important to know the condition of the yeast—when it's at the right stage of "budding" growth for introduction into fermenters.

While on this subject, it's noted that a leaky filter is likely to pass micron-size solids which, in some cases, may not be measured by a turbidity meter. A bypass hookup with the Coulter particle-size counter can measure leaked-through particles for switchoff of the contaminated flow.

In almost the same way, foreign matter or finely suspended proteins will cloud beverages like soft drinks.

When it comes to handling a blend of finely divided material (essential components in many foods), size also plays a significant role. For example, products in which the various particle sizes are uniformly distributed have, in the aggregate, better packing characteristics than those of uniform particle size. However, latter might have better flow properties. Powders (of uniform particle size) might not flow, but granules (of uniform size) will. Hence, it might be necessary to agglomerate the powders into larger free-flowing granules.

Controlled particle size also influences performance of filling machines. Product's bulk density will be consistent, resulting in greater filling accuracies. Packers might also be able to switch from slower gravimetric to speedier volumetric fillers.

Stumbling Block

Urgent problem has been the need for more accurate, speedy measurement of particle size—a streamlining of the method to create "particle pulses" and so permit automatic control of size-reduction machines. Thus assured of greater uniformity in quality of his products, the processor is able to switch a batch operation (requiring sampling to determine and endpoint) to a continuous one running on a pre-set time and temperature basis.

What makes particle-size measurements tough is the complexity of the variable (size vs. quantity). It means that a particle size-particle quantity curve must be interpreted instead of simply read—as, for example, temperature or pressure on a graduated scale. And frequently, more than one of the values are of interest on such curves.

Conventional methods may be variously criticized as tedious, time-consuming, inaccurate, unreliable, and limited either as to size range or to products.

Oldest, simplest, and most direct for determining size and size-distribution of fine particles are microscopic and sieving methods.

Microscopic examination is tedious, but gives reliable, reproducible results if careful measurements are made. Optical systems enable particle measurements in sizes ranging 0.5-500 microns. Electron "mikes" are good for sizes in the 0.001-10 range.

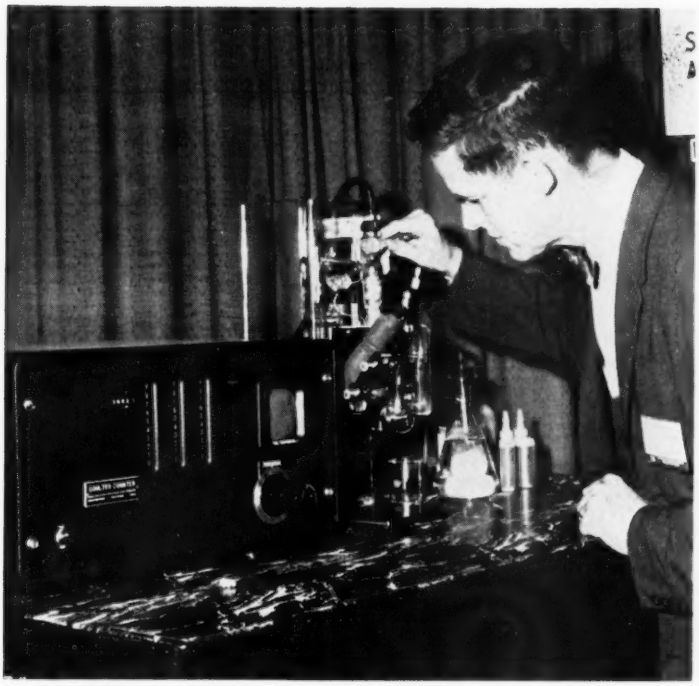
These methods have even been automated to make them simpler, more reliable. For instance, the flying spot particle resolver, consisting of a TV camera-microscope hookup, transmits signals on number and size of particles to a computer. Instead of a TV camera sweeping microscopic images and relaying signals to a computer, the Casella automated mike oscillates the glass slide (containing sample) under a scanning slit and relays pulses to computer.

Sieving is also tedious. Taking a lot of time, it can cause attrition. And it won't work with sticky products. Nor will it measure particles below 50 microns.

Method involves shaking samples through a series of pans, each with a wire cloth having smaller size openings than the preceding one. This way, sample is separated into a series of fractions, as individual particles arrive at the screen they can't pass through.

Sedimentation (Stokesian methods). Employed, here, are a variety of gravitational sedimentation methods for analyzing particle size. By carefully reviewing the many techniques based on Stoke's law, one can be selected for a specific purpose.

These methods don't work with



NEW ANSWER to particle size measurement is this electronic counter that can be employed for on-stream process control. It works on principle of changing resistance between electrolyte-immersed electrodes producing voltage pulses proportional to particle volume.

sticky products. They're usually time-consuming and difficult to conduct because of electrostatic effects causing particles to agglomerate in test vessels. However, by using air (as setting means) or by centrifuging, these methods have been made speedier. They have been further simplified through use of data-recording charts.

Check of the various methods accents the crying need for a faster, more versatile, more accurate technique—preferably one capable of providing a continuous signal for automatic on-stream process control.

Stumbling Block Hurdled

To meet this need, the previously mentioned Coulter counter has been developed to determine number and size of particules suspended in an electrically conductive liquid. Principle employed relates to flow of a dilute suspension of particles in electrolyte through a small aperture (one at a time) with immersed electrodes on either side.

Particle passage displaces electrolyte within aperture, momentarily changing resistance between electrodes to produce voltage pulse proportional to particle volume (bigger the particle, larger the pulse). Each pulse is electronically amplified, scaled (classified), and counted.

Pulses are displayed as a pattern of vertical "spikes" on an oscilloscope screen. Pulse pattern is a guide for measurement and a monitor for instrument performance. Pulses are also fed to a threshold circuit with an adjustable screenout voltage level. This way, pulses reaching or exceeding this level are counted. Level is indicated on screen by a brightening of pulse segments above threshold.

Direct data is provided for plotting (log-log) particle volume vs. relative count above stated size (cumulative frequency). It's done by adjusting raw counts for coincident particle passage through known probability factors, and multiplying threshold settings by a calibration factor (constant for given aperture size, electrolyte resistivity, and amplifier gain setting).

Such plotting is desirable for two reasons: (1) Large ranges of count and particle volume, and (2) increasing sensitivity of this type of distribution curve toward size extremes.

For many purposes, size distributions are commonly expressed on a weight basis. So direct frequency data can be readily converted for plotting particle diameter vs. cumulative weight (weight percent above stated size).

Fractional distributions are also useful in certain cases, and data can also be converted for plotting particle size vs. count or weight fraction per unit of size.

Size analyses may also be presented as probability grids, area distributions, and short tabulations or ratios covering specific size levels for routine process control.

What Can Be Done

In a sense, the counter converts a "population" of various particle sizes into corresponding voltage pulses at rates up to 1,000/sec. These pulses can then be electronically sieved or converted into electronic data for such purposes as—

1. Discriminating and counting (digital display) at different particle-size levels successively. Electronic "sieving" may be done singly to adjust for one size level, or several size levels can be simultaneously measured.

2. Measuring at one or two critical size levels for a specific amount of sample.

3. Automatically computing and drawing a complete distribution curve, including integrating to obtain weight distribution (if desired).

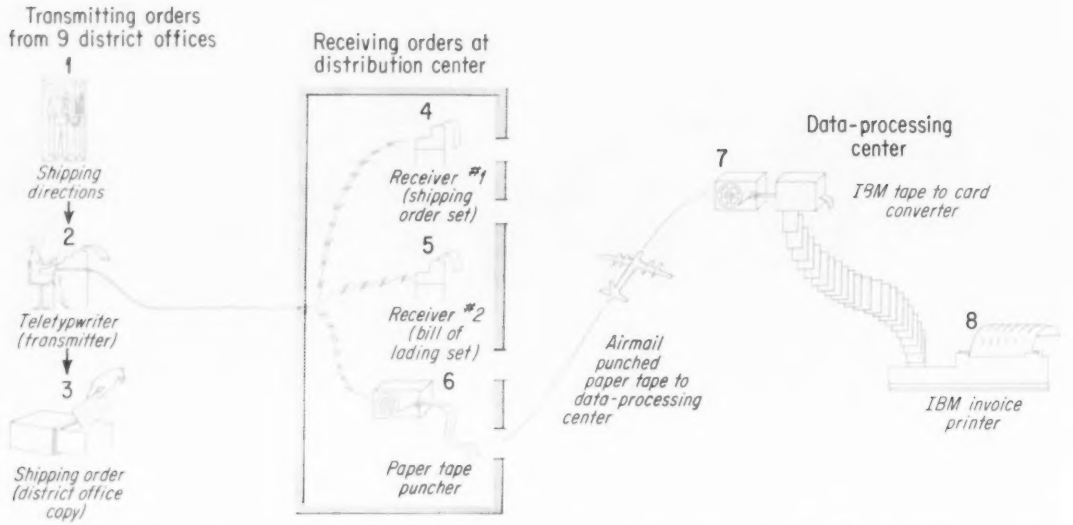
4. Using information for activating an "out-of-bounds" alarm, valves (solenoid or modulating), or other positioning motors, as well as for feeding a computer for multiple valve and positioning control.

5. Tape recording (for analysis) a time record of particle-size changes in a process. Examples are rate certain solids dissolve in solution, swelling of starch granules in starch-vinegar slurries (in making salad dressing), and budding of yeast (in fermenting beer).

Particle size is the answer to many practical problems. And adoption of the electronic particle-size counter opens up a wide variety of potential applications.

Because of the importance of size, we're interested in the mean characteristics of a large collection of particles. And we're especially interested in statistical measurements covering mean particle size and the distribution of particle sizes.—*End*

Order-Filling Triple Play!



IN LIGHTNING 3-way system, GM district offices (left) teletype orders to distribution base (center), which in turn speeds teletype punch tapes to data-processing office (right). Data are then directly IBM-converted to invoices and statistical records. Numbers key to step-by-step details in article.

Speeds Shipping Service With

General Mills' leased-wire hookup enables district offices to wire orders directly to distribution center, abolishing past intermediate steps . . . Integration with data processing brings extra saving

OUT-OF-STOCKS still a headache? If so, consider the "fact-flash cure"—aimed to banish such pains quickly, efficiently, economically.

Prescribed is TOPS (short for teletypewriter order-processing system).

Such a setup recently went on-stream in the General Mills Buffalo, N. Y., distribution center that services customers in New England and Mid-Atlantic states. The program, using AT&T's leased wires, links nine district offices with the center.

With TOPS in action, the company has greatly improved and accelerated shipping and billing services. Most important, the system plugs up those out-of-stock loopholes that drain away sales and weaken off-the-shelf performance.

Sums up V.-P.-Marketing E. H. Andreson: "It's another step to give customers better and more efficient service on orders."

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Benefits to All

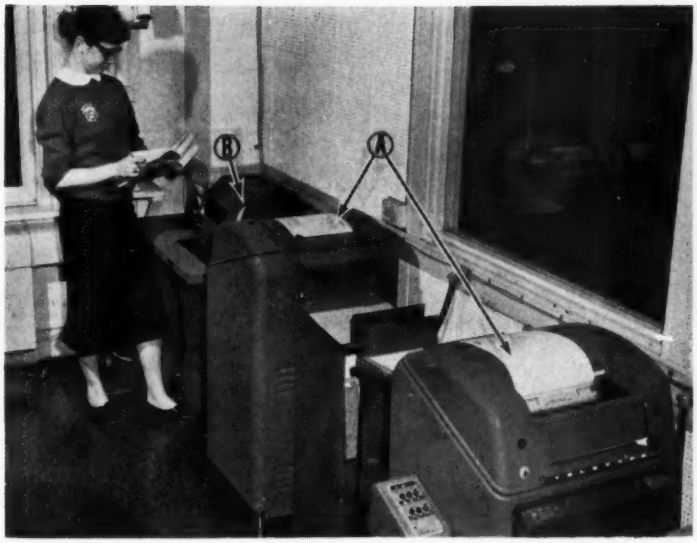
Through integration of order-billing with wire transmission of shipping orders from the nine district offices to the center, GM figures it reaps these advantages:

. . . Speedy, accurate preparation of shipping orders, bills of lading, invoices, and statistical records.

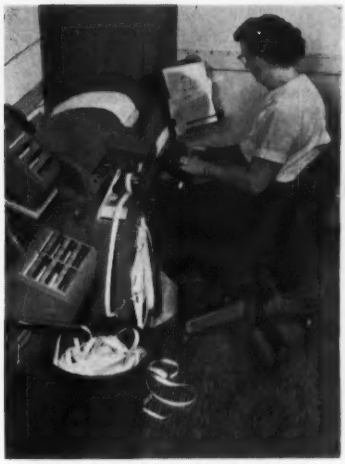
. . . Less delay in getting orders to the center, meaning more dependable deliveries to customer and reduced capital investment for inventory.

. . . Easier, more efficient invoice processing for customer. Invoices are more legible, and items are listed in uniform sequence to facilitate checking them against original orders, price lists, material-received reports, etc. As a further aid, possibility of errors—along with costly follow-ups—are minimized.

According to W. R. Nelson, comptroller of Grocery Products Div., the Buffalo system now handles all customer orders from New England and Mid-Atlantic states.



RECEIVERS (A) in GM's Buffalo, N. Y., distribution center gather salesmen's orders directly relayed from nine district offices. Machines type out shipping order and bill-of-lading sets. As orders are received, tape perforator (B) makes up order copy on 5-channel tape that's airmailed to company's Park Ridge, Ill., data processing base.



ADMINISTRATIVE MESSAGES are transmitted and received on machines like this one. Unit, at GM's Buffalo office, also monitors other machines in teletype order-processing system.

New Teletype Order-Processing

As added capacity becomes necessary, more orders can be handled by stepping up the transmission from 75 to 100 words a minute.

General Mills' system fits hand-in-glove with equipment employed at company's Park Ridge, Ill., electronic data-processing nerve center. Punched paper tape cut on a Buffalo teletypewriter as a by-product of order writing is airmailed to Park Ridge and used as a basis for writing invoices and compiling delivery statistics.

Before examining the mechanics of the new order processing, let's see how GM used to handle customer needs and why the company adopted the new method.

Before: Salesmen phoned or mailed orders to district offices which, in turn, re-processed and mailed them to the distribution center. Manually-typed in ditto master form, they took at least a day to reach the center.

Although emergency needs were teletyped into the center, they still required reprocessing (typed by hand into workable shipping orders). In addition, district offices had to prepare and mail to Buffalo confirming papers for all wired orders, thus piling up costly and time-consuming work duplication.

Frequent delays resulted when orders were received too late in the day for processing or for inclusion in production schedules drawn up at mill planning sessions.

'How' of Operations

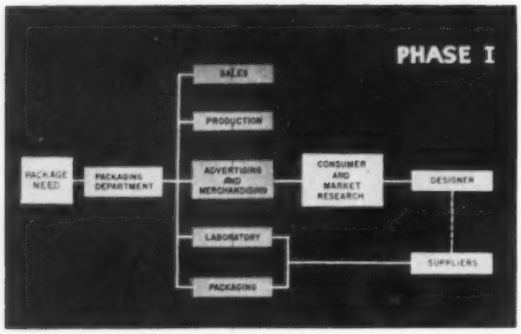
Now: To follow, step-by-step, the processing of orders by the new system, refer to accompanying drawing. Orders, as before, are phoned or mailed by salesmen to district offices. There, a clerk completes the shipping directions—indicated by (1) on diagram. From here on, TOPS takes over. Offices and distribution center are equipped with teletypewriters (Series 28). And in district offices running high volume there are additional tape-cutting machines.

From sales offices, orders (containing product codes, quantities, and method of shipment) are transmitted to Buffalo via teletypewriter—(2) in drawing. The codes reduce line time and facilitate subsequent data processing. A copy of the shipping order is retained at the district office (3).

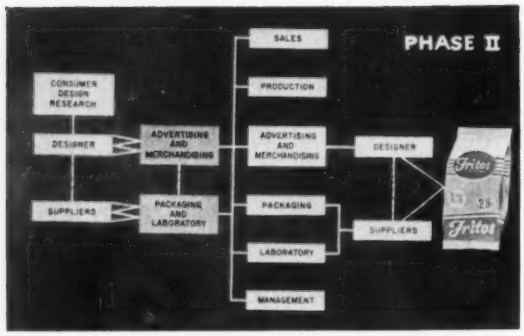
When Buffalo's page printers (4 and 5) receive teletyped orders from the district offices, each receiver prints a set of hard copies. Receiver No. 1—see (4)—makes up a set of shipping orders—an original and six copies that list product codes, number of cases, and shipping destination. These are used to assemble and ship orders.

A second set prepared by receiver No. 2—see (5)—makes up a bill of lading for the traffic department. These copies contain instructions similar to those in the shipping order set. (*Continued on page 68*)

Frito's Formula for 'Buy-Me' Packaging



PHASED FOLLOW-THROUGH begins when packaging department, handed assignment to come up with new container, huddles with sales, production, advertising, and lab. In-the-field research is carried out by ad department, and findings are interpreted for outside designer. Meanwhile, based upon lab tests, suppliers are contacted on what will be needed.



IMPORTANT ROLE played by outside counsel is shown here. Supplier and Frito's packaging and lab departments work hand in hand developing new container, while designer and ad unit test graphic ideas on consumer groups. Preliminary designs and packages are then evaluated by various company departments, as well as by top management.

More for Package Dollar

AMA conference gets inside use-proven tips on ways to build more profit-making and cost-cutting into packaging programs

BETTER INTEGRATION of packaging into business operations as a profit-building, cost-cutting technique is getting more top-management scrutiny these days.

That's because—as speakers pointedly warned at last month's AMA National Conference—packaging's broad reach across corporate functions is too important to be left to haphazard direction.

Food companies that already have achieved improved coordination between packaging, production, sales, merchandising, and purchasing report these benefits: (1) Elimination of waste and duplication; (2) minimized costs as result of standardized specs; (3) smoother development of new container design; (4) stronger contribution by planned packaging to the marketing concept.

Why Integrate?

Spurring the trend to planned controls, said R. L. Lozon, Glidden Co.'s director of purchases and trade relations, is the need "to get each department to understand the other person's problems." Glidden's solution was the creation of a package coordinator post (filled by Lozon). Here's how the step is backed up:

Lozon keeps a running catalogue of all packages and related equipment used by the company. Aim here is two-fold: (1) Standardize the different specs for the same materials used by the different divisions so as to get cost and quality benefits. (2) Make sure equipment limitations are kept in mind when new products or packages are planned.

A central information center, located in purchasing, keeps all parties posted on new containers or equipment developed by any division. Every 3 or 4 months, Lozon huddles with regional sales managers and production heads to see whether the packages they're using do a satisfactory job, and what improvements are needed. Problems and suggestions then are followed up with suppliers.

Integration is further helped by two special committees. A headquarters label committee, composed of representatives from legal, purchasing, and sales areas, passes approval on all printed packaging materials before they are bought.

Because Glidden's Bethlehem, Pa., plant handles a wide range of container types, a merchandising committee based in the factory acts to keep headquarters abreast of what's going on. Made up of the general manager and reps from sales, production, and cost departments, the group meets once a month to review packaging needs. The food division's marketing director usually attends, too, and he keeps purchasing posted on future plans.

The packaging buyer from central purchasing sits in on the sessions three or four times a year. To round things out, central purchasing buys all packaging materials (except shipping cases, pails, and drums), thus giving Glidden a good control point.

Packaging rates top-level interest, Lozon pointed out. All new packages must be approved by the division's operating V. P., for example, and major container changes must be OK'd by the president.

With today's competitive pace obsoleting packages faster than ever before, the integrated set-up acts as a safeguard against costly innovations that don't weigh all the ramifications of a change, Lozon stressed. If the sales department plans a campaign around a new package, he explained, consideration must be given to the limitations of present filling lines, how long it will take to modify or install new equipment as well as fill the pipelines, and the lead-time required by suppliers to check out the new materials.

Speed's the Essence

Carl D. Schoby, manager of package development and design at Armour, said his firm is sold on the integrated approach (see FE Sept '59, p. 60) because "it enables us to move in a hurry when fast action is needed." Equally important, because it helps "the finished package to reflect the best of combined efforts—especially so for new products, where the final package can be as vital as the item itself."

Use-tested ways to prune packaging costs were spelled out by conference speakers.

If a new package has several component parts, Glidden tries to use a single source, Lozon said. That way, he claimed, inevitable start-up problems "can be solved quicker and with less argument as to who is to blame."

Where there's a question of what weight or strength to use, the company leans to the safe side on original orders. After the filling line is running smoothly, Lozon said, "we start cutting down gradually on specs until we find the safe minimums."

If a new package calls for a big equipment outlay, Glidden may use a custom packager until experience shows what the product volume will be. Also, packaging orders for new products are kept conservative at first, to allow time for necessary modifications before the final design is hit upon.

Increased use of suppliers' specialized services was urged by John R. McCarty, Frito V. P. "We learned a long time ago that we can't possibly do all of the specialized jobs required in today's competitive packaging field," he conceded. "In the end, outside services do some jobs at less cost than we can."

Phasing packaging in with the marketing concept, to build consumer-appeal products, also came in for discussion.

At Armour, the development and design department is represented on the new products committee. This set-up, said Schoby, keeps his group on top of new ideas and plans, and helps to simplify the selection of containers as soon as the new item is conceived.

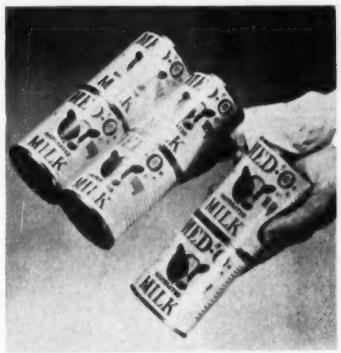
Package planning on a new Frito product starts with the company's research lab, McCarty said. There, tests run under simulated climatic conditions found throughout the firm's marketing area measure containers in terms of shelf-life, packing, sealing, and shipping characteristics.

Special problems that defy solutions are handed out to suppliers, who proceed according to standards set up by Frito.

Once the company's lab has approved a suitable container material, R&D work begins on the graphic design. Sales, advertising, and merchandising departments all take a hand in this, surveying competitive packages for pinpointing areas where improvements can be made.

Their findings are turned over to an outside designer, who later tries out his graphic ideas on consumer panels before coming back to the company with preliminary color sketches. Final designs are then tested again with consumer groups.

—*FE Staff*



LOW-COST MULTI-PACK made of shrinkable polyethylene (DuPont) offers clear view of package design, may save as much as 50% compared to price of paperboard carriers. (300)

PORTIONED BOIL BAGS of heat-sealable polyester film (Minnesota Mining) are perforated to allow housewife to cook desired number of wieners at one time, save the rest without fear of spoilage. (301)

Versatile Packages Gain

PLUS-VALUE containers, that display well in the store and save work in the home, dominated the displays at the AMA Show. Also noted were stepped-up efforts to marry newer extra-protection plastics and foils with traditional low-cost paper. Here are the highlights:

Tetrahedral paper-film-foil package (Leedpak) that's said to offer better indexing than earlier versions. Made from pre-printed roll stock, package former can be hooked to existing filling lines. National Dairy plans to use container (with "built-in" polyethylene straw that pops out when package is opened) for non-carbonated fruit juices. A Chicago firm will use the innovation for a line of flavored syrups that will appear soon. (302)

A thin-walled, vacuum-formed, high-impact polystyrene container (Dow), with built-in pastel colors, is offered as table-ready serving dish for dairy items. Borden plans to use it for cottage cheese. (303)

Bag-in-box includes folding carton with a variety of tack-sealed inner liners that provide air-tight enclosures for liquid products (Pneumatic Scale). Using foil or free film, container is seen promising for non-carbonated beverages, dehydrated foods, and cereals. (304)

Push-and-serve tube for ice cream has bottom plastic disk that's pushed up to expel contents, which can be sliced off in desired size (American Can). Paperboard unit is lined with foam plastic that slows down defrosting, comes with metal cover-all lid. (305)

New-type cellophane (Du Pont) that heat-seals at temperatures at least 50 deg. lower than possible for other cellos, speeds machine wrapping as much as 10%. Film belongs to MSD family (yield: 21,000 sq. in. per lb.). (360)

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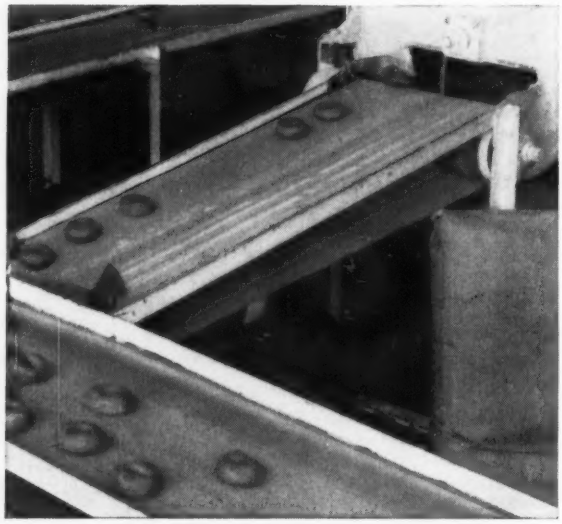
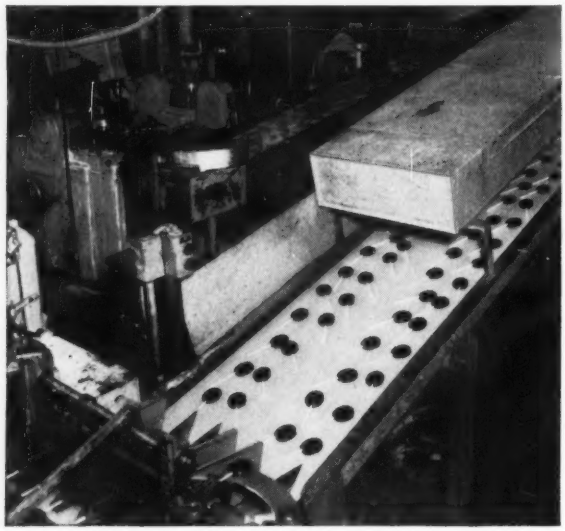




B.F.Goodrich conveyor belts meet FDA's new requirements

FOR over a year now, a task force of B.F.Goodrich scientists and technicians has been conducting thousands of experiments in the area of food additives. Its mission: to evaluate the company's rubber products subject to the new food additive amendment effective March 6.

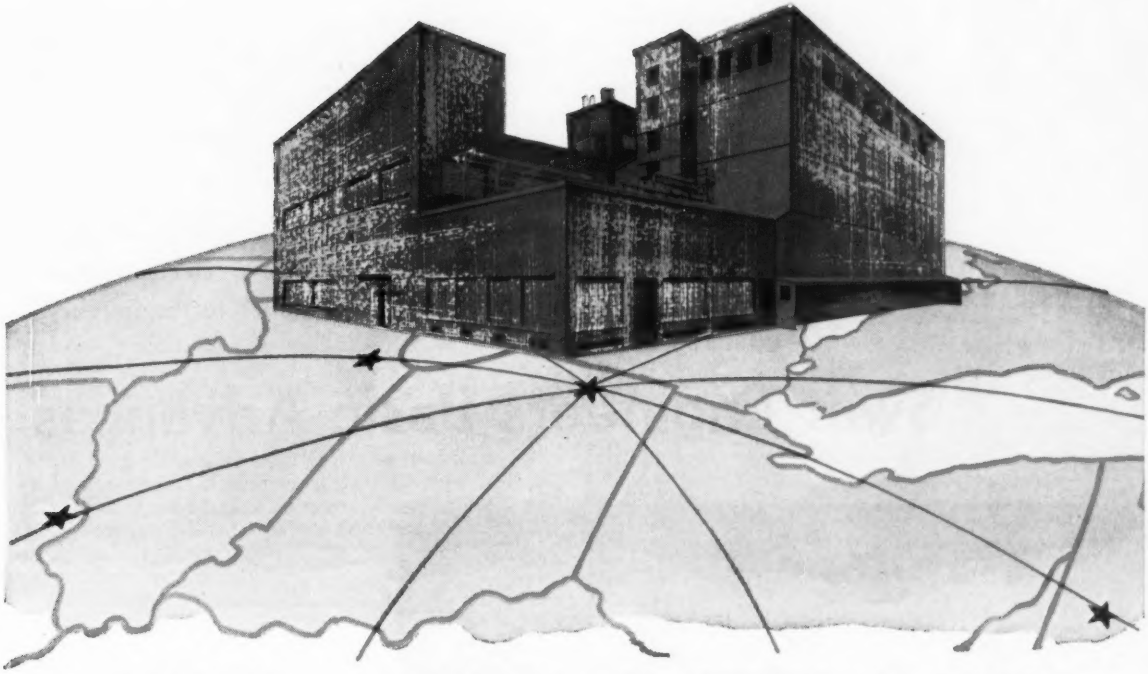
The result is that B.F.Goodrich is the first company in the rubber industry to have products found suitable by FDA for use in food processing operations. These products include conveyor belts for carrying dry, aqueous and fatty foods, brewery hose and milking-machine inflations.

The FDA must be satisfied that ingredients used in the manufacture of rubber and vinyl products do not contaminate the food they contact. The exhaustive tests by B.F.Goodrich have not only qualified materials used for years in B.F.Goodrich products, but have also established as acceptable some new materials which do a better job than those previously used.

The time and effort put into this evaluation and testing program is another example of how B.F.Goodrich goes all out to solve a problem—whether it's for a single customer or, as in this case, an entire industry. For more information on any of these improved products, developed for the safe handling of food, call your B.F.Goodrich distributor, or write *B.F.Goodrich Industrial Products Co., Dept. M-814, Akron 18, Ohio.*

B.F.Goodrich

CONVEYOR BELTS



MILES...CLOSER TO YOUR PLANT

new basic source of citric acid U.S.P. is centrally located

Whatever you're looking for in citric acid . . . superb purity, swift service, or a reliable source . . . there are good reasons for getting better acquainted with Miles Chemical Company in the near future.

First of all, Miles citric acid U.S.P. is produced at a convenient Midwest location (Elkhart, Indiana). Rail and truck service in any direction . . . in *your* direction . . . is remarkably fast. The expanded plant capacity at Miles assures an abundant, ever-ready supply of citric acid which can be started to your receiving dock or siding within hours after your order is placed.

What's more, Miles citric acid is exceptionally pure. Years ago Miles started its own production of citric to fill its needs in producing pharmaceuticals. So Miles pioneered a unique deep fermentation process to yield a product meeting the most rigorous purity and mesh specifications.

By purchasing Miles citric acid you, too, can take advantage of this rigorous control. *We would like to talk with you about supplying your requirements and specifications.* A Miles Chemical representative can be in touch with you within a few days after we receive your inquiry. Please write.

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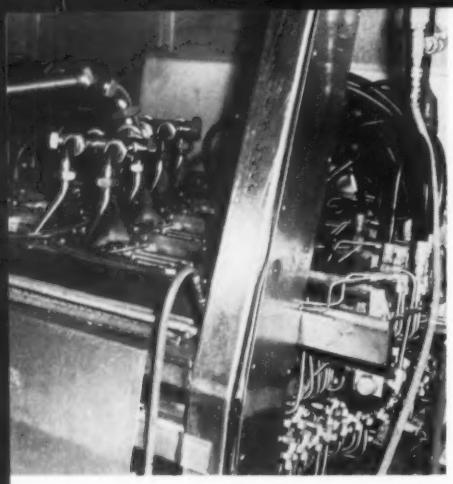
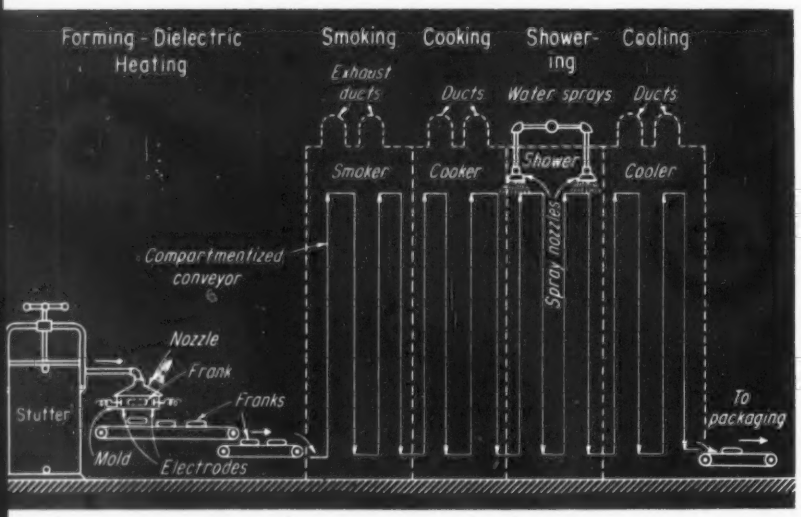


KEY TO CONTINUOUS operation is this forming unit. Meat emulsion from stuffer is piped to extrusion fingers that fill Teflon forming molds (4 molds to each of 8 blocks). Molded emulsion is protein coagulated by dielectric heating and ejected onto conveyor for further processing. Hydraulic action moves molds alternately to fill and heat positions on 18-20 sec. cycle, automatically.

Revolutionary new system for continuous frankfurter production introduces innovations in unit processes and operations of wide significance to the industry

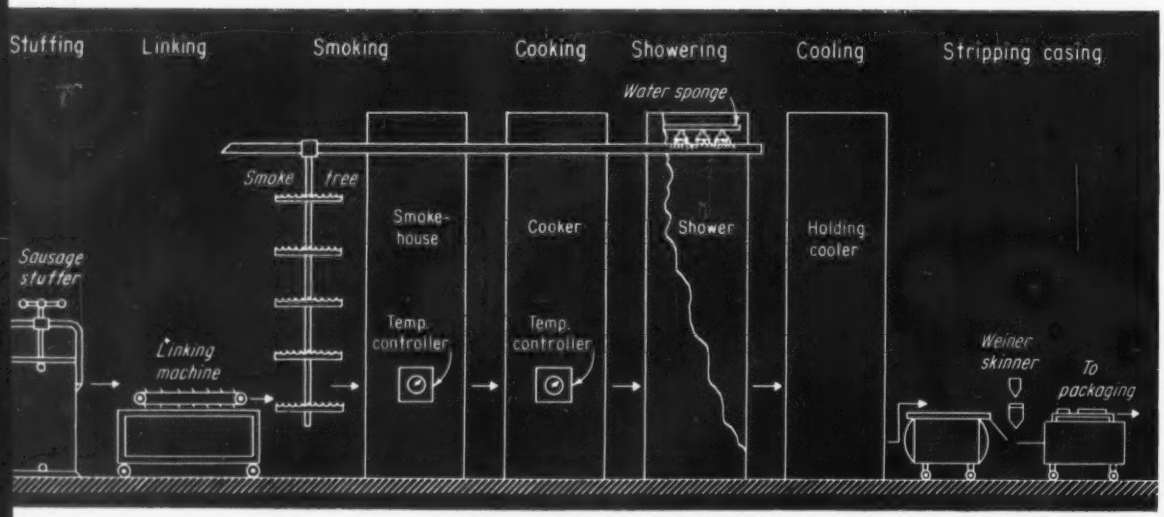
Swift Engineers Basic Advances



NEW continuous frankfurter process developed by Swift.

← NEW REPLACES OLD ↓

OLD conventional batch method of making franks.



LOOKING into the chemistry of your product while it's undergoing processing can open up possibilities of new production techniques that you may never have dreamed existed. This tack may even tip you off to a product's physical-chemical change (during manufacture) that'll help you more easily solve a mechanical production problem.

All too often, people take the "front-door" approach to a problem, thinking that mechanical modifications *alone* are the only solution. Too infrequently do they take a "back-door" look at a product's chemistry. If they did, then they'd probably come up with an easier, better way to research-develop a more efficient process.

For years meat packers have been examining new ways of continuously making skinless frankfurters. They've been stymied. Reason? They've "lived" too long with conventional frankfurter-making techniques.

Brainy R&D Work

But Swift & Co.'s researchers took the food chemistry approach and came up with a radically new method of continuously producing 1,000 lb. of wieners an hour, ready for packaging in 75 min.

What they did was to take advantage of the thermo-chemistry of the meat emulsion. They worked out a way to heat-form the emulsion in a mold, thereby producing a "plasticized" wiener and eliminating the expendable casing and several operations.

Swift researchers developed a system of extruding emulsion into electrode-containing Teflon molds and then using the principle of dielectric heating in the kilocycle frequency range. High-frequency heating of the mold-enclosed emulsion coagulates the meat mass at an even rate—with no hard core or soft center in the meat.

Control Potentials

Heating in this manner suggests unique control possibilities (not mentioned by Swift). For one, measurement of electrical energy passing through an emulsion should provide significant information about the emulsion's composition and density. Then, by employing a feedback loop, emulsion-blending operations might be automatically controlled to obtain more uniform composition.

In the Swift process, the key to the forming operation is the production of an emulsion with the necessary characteristics. Such an emulsion permits "setting" by electronic heating to overcome the attendant mechanical difficulties associated with heating by steam and other radiant means.

A lot of researching also went into selection of a material going into construction of molds. Teflon was chosen because it is smooth, inert, non-metallic and non-sticking.

With the forming problem solved, Swift devised a mechanical method of ejecting meat from molds and onto a stainless steel compartmentized wire-mesh belt. Next step was to integrate subsequent multiple process functions into a single unit to make operation *continuous*.

This was achieved by carrying the product on a basket-type conveyor through a single unit housing smoking and cooking, showering and chilling operations.

The Pay-Off

Results? Count 'em:

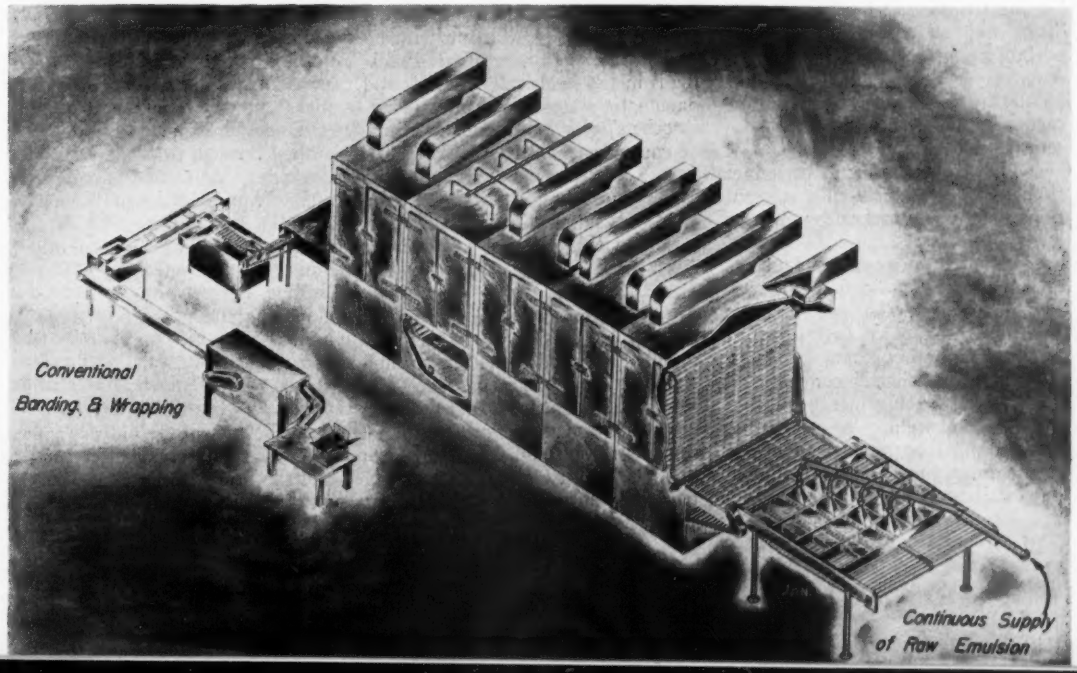
. . . **Smooth production flow**—Feeding raw ingredients into the continuous system at one end and then discharging ready-to-package product at the other. Continuous system hooks up five unit operations into a single coordinated line.

. . . **Compact space**—Limitations of buildings—low ceilings, limited floor areas—are no obstacle. Each of Swift's two units—one at St. Joseph, Mo. (operating 4 years at a rate of 800 lb. per hr.) and the other in South San Francisco (running 2 years at 1,000 lb. per hr.)—occupy only 12x35x50 ft. of space. Units can, however, be constructed for upward tiering or outward extension—even reduced in size.

A conventional process might re-

JOHN ZIEMBA
Associate Editor, "Food Engineering"

GREAT ADVANCE in food processing has been achieved through development of this continuous frankfurter operation. Meat from stuffers extrudes into Teflon molds (right) and is "set" by dielectric heating. Ejected from molds, franks travel by conveyor through smoking, cooking, showering, and cooling, then discharge to packaging.



IN THIS ENCLOSED UNIT, heat-set, molded franks are conveyed in up-and-down manner through smoking, cooking, showering, and chilling sections. Oven sections are temperature and humidity controlled.

quire twice as much floor space for equal capacity.

. . . **Reasonable investment**–According to B. T. Hensgen, Swift's associate director of engineering research, capacity-balanced units can operate 24 hr. a day (with exception of clean-up time). This reduces equipment investment to where it's competitive with conventional units.

. . . **No more casings**–By abolishing artificial casings, packers can make significant savings (amounting to hundreds of thousands of dollars annually for some of the larger firms). And there's no longer need of purchasing, billing and handling inventories.

. . . **Fewer processing steps**–Swift's new system abolishes machine-linking and stripping casing from franks. Saves, too, on cost of linking and peeling machines. Roughly, a linker costs about $2,000, a peeler around $4,000. It also eliminates smoke cages and overhead monorail systems.

. . . **Fewer workers**–Cuts personnel from about five or six on a conventional line (up to packaging) to three on continuous system.

. . . **Better work control**–Prevents doing unnecessary work, since system is compact, abolishes multiple handlings, and isn't tied up with production of other sausage products.

Manual handlings by conventional methods take a big bite into labor costs. From stuffing to packaging, product must be manually handled over a dozen times–stuffer to linker; onto sticks and then smoke trees; in and out of smokehouse, cooker, shower and cooler; and then finally the peeler.

. . . **Uniform quality**–Since production is continuous, quality of franks doesn't vary. Uniform heating in molds eliminates wieners with soft centers, prevents cracking and checking of product surface in cooker.

. . . **Simplified packaging**–Frankfurters are mold-formed into links from 10 to 14 per-lb. count as a result of emulsion consistency and accurate molding. And the franks can be packaged on a count-per-pound basis to abolish the costly labor of check-weighing each package. Swift, however, does spot-weigh packages as a check on system's operation.

Trouble with conventional process is that batch-produced emulsions vary in consistency and density. These variations, along with "finger-feel" gaging of casing being stuffed, make it difficult to control uniformity of links.

. . . **Less chance of product contamination**–At no step in the process–except for packaging–is product manually handled. According to J. H. Silliker, Swift's head bacteriologist, elimination of handling, automatic temperature control, and quick processing (75 min. to finished product) minimize objectable slime-producing bacteria and greening.

. . . **Simplified sanitation**–System is piped for in-line cleaning, and conveyor is self-cleaning following each forming cycle. Each day it takes about 8 man-hours to clean multi-head former and ovens.

. . . **Easy maintenance**–Aside from simplified cleaning, maintenance is an easy chore. Swift reports original Teflon molds have been used for 4 years at its St. Joseph plant, with no evidence of mold wear. Only checking is in the electrical, hydraulic and pneumatic systems, as well as drive-sprockets' play. Equipment lubing, of course, is essential.

. . . **Better yield** results from product uniformity, automatic control and system integration. Raw material yields within a 1½% variance are assured.

Potential Applications

What about adopting the continuous system for other products? By interchanging molds, emulsions might be formed into patties (round, square or rectangular), "chops," or "cutlets." Certain items could be partially cooked or processed into ready-to-eat form. Larger size sausage items like smoked bolognas, braunschweiger, luncheon meats, meat loaves, etc., are other possibilities. Savings, however, would not be as great for meat loaves.

Other food industry applications? Possibilities are that trimmings could be converted into a more usable form. Take poultry. Necks, wing ends, backs, gizards and even bruised birds could be ground and mixed, along with extenders. Then the emulsions could be molded into patties, sticks or drumsticks. Fish and shellfish meats also could be prepared into an emulsion for forming into any of many shapes and sizes. No reason why process cheese can't be shaped into forms inexpensively, and even smoked. Imagineering created the process and could put its principles to new uses.

The Old Way

The conventional batch method of making frankfurters varies from plant to plant, but labor requirements are about 2 man-hours per 100 lb. Accompanying flowsheets compare a typical batch operation with the new continuous method.

Emulsions are either prepared in: (1) silent cutters (revolving bowl chop-type mixers) that take about 20 min. to produce a 500-lb. batch, or (2) silent cutters (for a 2½-min. mix) and tandem-arranged emulsifiers (for a 2-min. coarse and fine grinding). Emulsions are then transferred to a pneumatically-operated sausage stuffer (60 to 90 psi. pressure) feeding an automatic linking machine that string-ties or twist-spins 50-ft. stuffed casings into links.

Stuffing and linking a batch of emulsion take about 15-20 min.

Linked wieners are manually looped over metal rods or wooden sticks and transferred onto portable or monorail suspended cages to be pushed through smokehouse, cooker, showering unit and finally chill room. Approximate times involved are: (1) tree loading, ½-1 hr.; (2) smoking, 2-4 hr.; (3) cooking, 20 min.; (4) showering, 10-15 min.; chilling, 2 hr.

Peeling and packaging take 15-20 min.

New Way

Inefficiency of the old way spurred Swift's search for a better method, and the firm's R&D group spent 10 yr. researching and designing the new

IN ABOUT 75 MIN. skinless franks are discharged from continuous process conveyor to packaging line. Three men operate the process.

frankfurter process and equipment.

Briefly, new frank line operates this way: Stuffers feed emulsion at 150 psi. into a bank of extrusion heads to fill Teflon models equipped with electrodes. The filled molds are moved hydraulically to heating position and the emulsion in each is dielectrically heated to about 130F. to "set" the franks. Then the molds move back to fill position again, the franks being ejected when the molds contact the finger-like extrusion nozzles. The franks drop onto a stainless steel wire-mesh conveyor that discharges them into long basket-like perforated stainless steel compartments on an endless chain conveyor. The latter carries them in up-and-down travel through further processing.

In sequence, the franks are conveyed through a stainless steel-housed combination smoke-cook unit, then through showering and cooling sections. Finally they discharge onto a table-type conveyor that feeds conventional banding and wrapping machines. Packaging is by count, so many to the pound. The meat is smoke-cooked (to 160F.) for 45 min., showered for 8 min., and chilled (to about 45F.) for 20 min.

Dye can be applied, if desired, to color the franks.

Changing molds for the production of different-count franks (10 to 14 per lb.) takes about a half an hour.

Entire system is driven by a ½ to ¾-hp. motor. The process has a self-monitoring control panel (Westinghouse). And the steam-heated oven section is temperature- and humidity-controlled to assure consistent yields and uniformity of product quality.

Conveyor flow indicators aid operators to control product travel through continuous system. No operating phase is backlogged because of possible limitations of the various process units. Swift runs the process 16 hr. per day, but could operate it around the clock with time out for cleaning.

Selbach-Hill Corp. (New York City) holds exclusive rights to manufacture and it sells the continuous frankfurter production system under Swift & Co. patents.

German equipment firms will build the forming units and some ovens, other parts will be constructed in the U.S. Germans have lower labor costs and can fabricate equipment with precision.

Cost of large unit that handles about 1,000 lb. per hr. is tentatively about $150,000. And the packer pays a royalty in the range of $10 to $12 per hr. or buys user license. Capital investment is reportedly slightly less than that of new, modern conventional equipment of same capacity—and appreciably less when cost of extra building space is included.

Reporting extensive interest in the process, Seelbach feels that 75% of the frankfurter and luncheon meat business eventually will be continuously manufactured. Given time, the firm will have a series of models. By the end of the year, it will be operating a pilot plant for further development work.

To justify use of new high-capacity system, a large packer must process 1½ to 2 million lb. of franks annually. But a unit half the size of the first will be built for packers producing about 1 million lb. of wieners a year.

A labor saving improvement in packaging the processed franks is a collating machine that will feed to the banding and wrapping units by count. It is expected to go into Swift's St. Joseph meat packing plant soon.

What Others Are Doing

Swift hasn't been the only meat packer involved in developing a continuous frankfurter operation. Other packers have long recognized the need, and they have been at work on the problem.

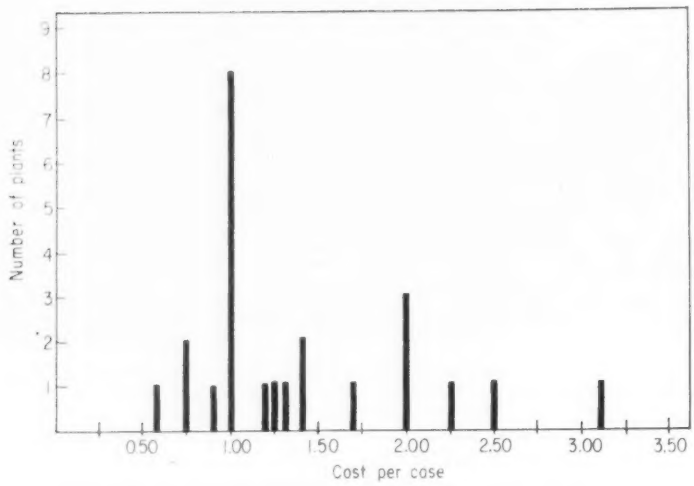
One packer reportedly has undertaken a different approach—stuffing emulsions in tremendously long lengths of casing. These lengths then would be reeled through subsequent process units, machine peeled and packaged.

Another large packer has almost completed development of a continuous machine and is even test-marketing its products in a limited area. Other smaller packers have banded together and engaged a large industrial research-development firm to produce a new frank process on a fully automatic basis. A unit reportedly has been installed in one plant for debugging.

End products differ in some ways from those made by the Swift process. They're similar to those manufactured by conventional methods in that surfaces of wieners are smooth and ends are round. Franks made by the Swift process don't have surfaces that are quite as smooth, and ends don't seem as rounded.

Cost of Swift's continuous frankfurter unit might be deemed prohibitive for the smaller packer, even if it's modified to fit his production requirements. Some small packers are producing only 25,000 lb. of wieners per week, with some being stuffed into sheep casings.

Several Chicago-area small packers queried felt, for the while, that they'd be satisfied with their present equipment. Their installations are flexible, and currently are producing a wide variety of smoked and non-smoked sausage products. —*End*



BIG VARIATIONS mark per-case cost of new canning facilities.

MANUFACTURING

Survey Pins Plant-Outlay Costs

Shows investment for new canning facilities "run wide" . . . freezing plants take more dollars . . . expansions favored . . . capital picture often awry

ARE YOU CONSIDERING putting up a new fruit-and-vegetable processing plant? If so, a sharper eye than ever is called for in your check of construction-cost data.

True, exact figures are not necessary in the early exploratory stages, when the feasibility of such a plant is being weighed. But certain guides definitely are necessary — and are just as important as the crop potential of the area, labor supply, water availability, waste disposal, transportation, and facilities for marketing your products.

In an attempt to develop such a guide, questionnaires were sent to 452 food processors from Georgia to New York. A total of 54 replies were received during the late summer and early fall of 1958.

These questionnaires consisted of 9 lengthy letters, 24 completed forms, 4 incompleted ones, and 17 that were not usable because the operators were not in fruit and vegetable processing.

Of the 24 canneries reporting, cost for new plant construction in 1958-59 varied from $0.57 to $3.10 per case, with an average of $1.38 (see first figure and Table I). Tomato canneries are among the least expensive to build, while baby food plants cost the most. The investments were about equally divided between buildings and equipment. (Table II).

Watch That Capital

In addition to these costs, working capital or line of credit is especially important. Too frequently, plants have failed because working capital was not sufficient or, as occasionally happens, was ignored. This money helps buy raw products and supplies, meets payrolls, and aids in carrying an inventory of processed goods.

According to the survey, approximately one-third additional money should be available for this purpose.

Another question posed was the advisability of expansion rather than building a new plant. Here, all but one respondent favored expansion of present facilities as a means of increasing production. This one company cited efficiency of operations, need to palletize, and econ-

FRANK B. THOMAS
Food Processing Specialist, North Carolina State College, Raleigh

TABLE I—PER-CASE COSTS Run From $.57 up to $3.10 for New Plants.

Number of Plants	Cost/Case (Dollars)
1	.57
2	.75
1	.90
8	1.00
1	1.20
1	1.25
1	1.33
2	1.40
1	1.67
3	2.00
1	2.25
1	2.50
1	3.10
—	—
24	1.38 average cos

TABLE II—PRODUCTS PACKED and Location Are Important Factors in New Facility Costs.

Plant No.	Minimum Capital Requirements (Dollars)	Production (Cases/Year) No. 2 Cans	Crops	State
1	300,000	250,000	Peas Beans Corn	N.Y.
2	100,000	50,000 (30 lb. cans)	Cherries	N.Y.
3	475,000	190,000 (303)	Peas Corn	Md.
4	90,000	100,000	Tomatoes	Md.
5	1,000,000	500,000	Corn Peas Beans Tomatoes Beets	N.Y.
6	100,000	100,000	Tomatoes	N.J.
7	100,000 +(300,000 working capital)	133,000	Tomatoes Snap beans	Md.
8	250,000 +(500,000 credit)	150,000	Pimiento Turnip greens Field peas Greens Squash Peaches	Ga.
9	100,000	100,000 (303)	Tomato	Va.
10	500,000	500,000	Peas Snap beans W. Potatoes Tomatoes S. Potatoes	Md.
11	500,000	500,000	Beets Carrots	N.Y.
12	200,000	350,000 (3202)	Cucumbers Peppers	Md.
13	200,000	100,000	Snap beans	Del.
14	75,000	60,000	Tomatoes	Va.
15	300,000 to 500,000	300,000 to 500,000	Peas Corn Snap beans Tomatoes	Pa.
16	350,000	250,000	Strawberries Raspberries Beans Tomatoes	N.Y.
17	50,000	40,000 to 60,000	Tomatoes B. E. Peas	Va.
18	50,000	40,000	Tomatoes	Va.
19	150–300,000	.....	Corn	Pa.
20	1,600,000	511,000 (48's)	Baby foods	N.C. & Mich
21	1,000,000	400,000	Snap beans Tomatoes Raspberries Strawberries	N.Y.
22	80,000	60,000	Tomatoes Corn Beans	Md.
23	75,000	100,000	Tomatoes	Md.
24	700,000	500,000	Snap beans Sour cherries Apples	N.Y.

omy of production as its reasons for considering a new plant.

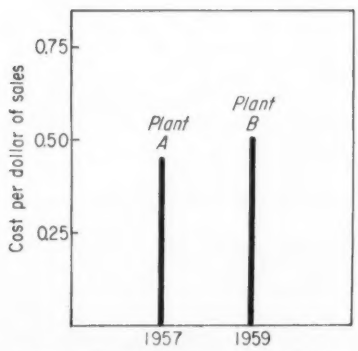
Those favoring expansion gave these reasons:

1. Existing plant is in right location and properly laid out.
2. It has labor supply, water, sewage facilities, adequate utilities, etc.
3. A good percentage of present equipment can be retained.
4. Overhead would be reduced.
5. In contrast, new-plant costs were deemed a high hurdle.

They felt that new construction might be desirable for them, but wasn't always feasible. Further, many respondents indicated that they are capable of increasing production with present facilities by as much as 50% without additional construction.

TABLE III——PRODUCTION and Sales Potential of Typical Freezing Facility (Plant A).

Item	Production (Lb.)	Unit Sales Price (Cents per Lb.)	Total Sales (Dollars)
Green beans	4,000,000	18	720,000
Leafy greens	2,000,000	10	200,000
Spinach	1,000,000	12	120,000
Strawberries	1,000,000	21	210,000
Broccoli	750,000	21	157,500
Cauliflower	750,000	21	157,500
Peaches	500,000	15	75,000
Total	**10,000,000**	**164**	**1,640,000**



COST OF FREEZING PLANTS has gone up since 1957.

Two sets of figures were available to the author on freezing plant construction costs (second figure).

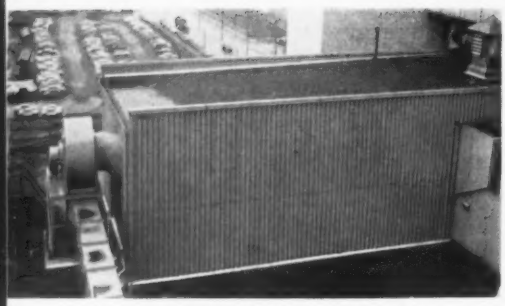
Plant A (costed in 1957) reported $0.42-$0.47 investment per dollar of sales, in comparison to $0.50 for Plant B (proposed in 1959). In both cases it was indicated that a minimum of 10 million lb. of production was the smallest economically feasible unit for operation in light of present day trends.

Estimated cost of Plant A was $700,000-800,000 for land, building, and necessary equipment — 60,000 sq.ft. would be desirable for the processing plant.

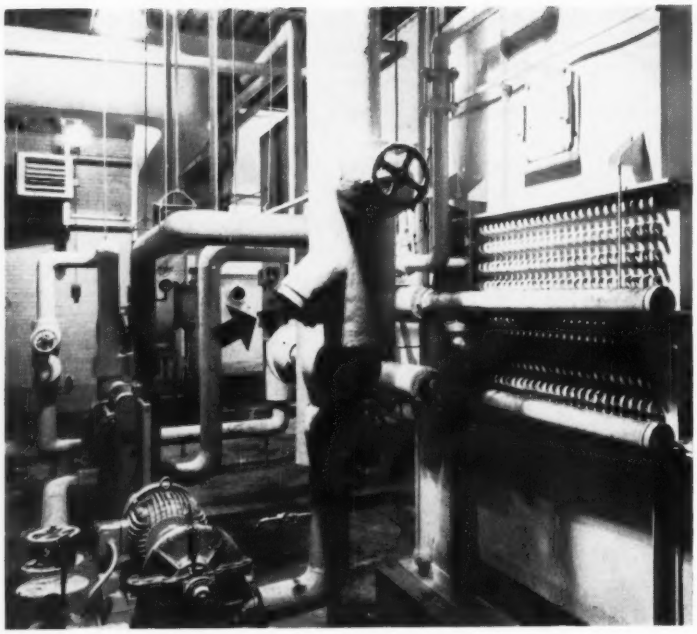
Operating capital of $250,000 would be required, plus arrangements for a short-term loan of some $50,000 to take care of peak loads at height of harvesting seasons.

This plant could ultimately process 10,000,000 lb. of produce (Table III).

Cost of Plant B was $1,000,000 for land, building, and equipment. Operating capital required, $500,000; capacity, 12-18,000,000 lb./yr., sales $3,000,000. —*End*



CONDITIONING EQUIPMENT in penthouse delivers low RH heated air to sugar drying operation 140 ft. away. Mixture of recirculated and fresh air enters through duct (lower right), leaves by 24 in. square one (left).



INSIDE PENTHOUSE are: Dehumidifier (foreground), air washer (arrow), regenerator (rear).

Chemical Dehumidifier

Unit feeds 18,000 cu-ft./min. of clean, dry, heated air to granulators. Also supplies discharge flight conveyor and conditions granulator room

A CENTURY AGO when the first St. Lawrence seaway opened the ocean-route to Montreal, John Redpath established a sugar refinery beside the Lachine Canal, where sailing vessels could unload puncheons of raw sugar.

Last spring, with the opening of the New Seaway, Canada & Dominion Sugar Co. opened a new Redpath refinery on Toronto's harbor-front a thousand miles inland.

The new plant can off-load and store 180,000,000 lb. of raw sugar and process it at the rate of 2,800 short tons per week into granulated white sugar for Ontario and western markets.

G. C. HENDERSON

Assistant to Chief Engineer, Toronto Redpath Plant, Canada & Dominion Sugar Co.

Drying Poses Problems

Refining of raw sugar to the table product is essentially the extraction of water and removal of impurities to provide a pure desiccated granular product. So when crystalline sugar enters the cylindrical granulators that provide a final drying, it contains 0.4–0.7% moisture. Thus, it must be further dried here from 0.7–0.01%.

At the Redpath plant, this is done with a Kathabar chemical dehumidifier (Surface Combustion Co.). This absorption unit, rated at 17,000 cu. ft./min., is currently delivering 9,000 cu. ft./min. of warm, dry, washed air to each of two granulators.

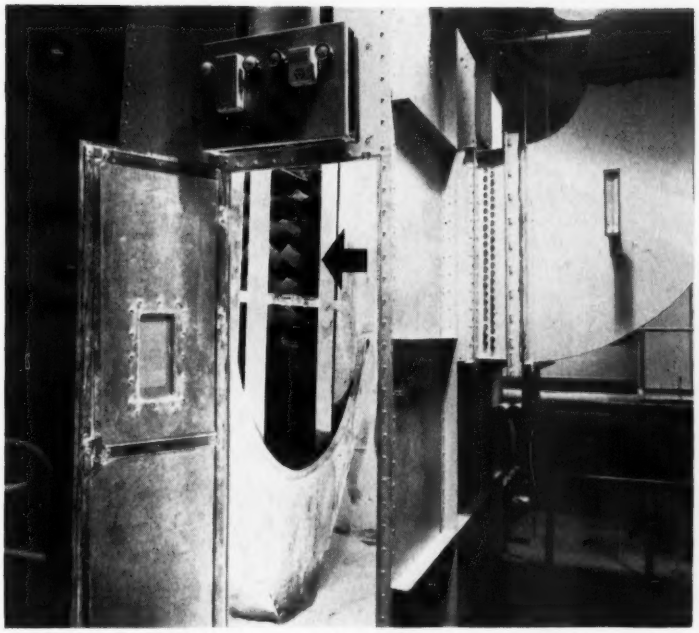
These units (Stearn Roger) are cylindrical drums (26 ft. long x 7 ft. in dia.) that turn at 86 rpm. Damp sugar is fed in at about 145F. It is agitated by toothed flights (plates projecting from the drum lining), and discharged at about 125F. in its final granular form of required dryness.

Holoflite units convey the sugar to the packaging building or storage silos, further reducing the temperature to 95F.

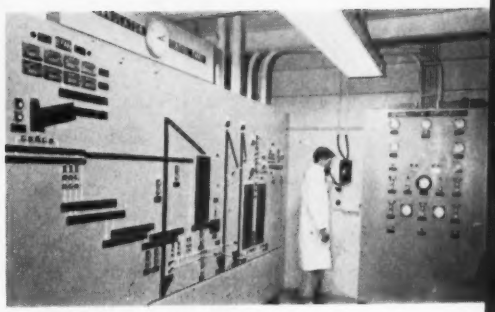
Dehumidified to a maximum 7% relative humidity at 120F. (36 grains/lb. dry air) by the Kathabar conditioner, the drying air is supplied with just enough pressure to reach the head of the granulator. It enters dry, warm, and slightly pressurized, and is drawn off under negative pressure, moistened, and heated by the sugar.

Advanced Air Drying

Hot process air from the plant and/or fresh air from the atmosphere is filtered, washed, and dehumidified in a rectangular (48x16 ft.) corrugated steel penthouse located on a set-back at the 4th floor level, above and about 140 ft. from the granu-



GRANULATOR has series of serrated plates (arrow) that agitate sugar to air drying. Duct (right) supplies conditioned air from penthouse.



CONTROL PANEL monitors granulator operation. Panel at right regulates conditioning equipment.

Speeds Sugar Processing

lators. Penthouse contains three units—the conditioner, an air washer, and the regenerator.

Air is delivered to the penthouse through a mixing box, where its temperature can be maintained at a minimum of 55F. The Kathabar system, which extracts moisture by chemical absorption, provides dry air that does not need either after-cooling or re-heating.

Because of the distance the drying air must travel, however, provision has been made for re-heating—when plant or seasonal conditions demand —by automatically controlled steam coils at entrance to granulators. Rotoclone dust collectors draw drying air through granulators, and air handling equipment is sequenced with them, to insure that conditioned air is supplied at all times.

City water is fed (250 gpm.) to air washer through a Rosenblad heat exchanger that warms the spray water in winter or cools it to lake water temperature in summer.

The dehumidifier sprays the air with a Kathene solution (lithium chloride), which extracts moisture (as well as any dust, odor, or bacteria not previously filtered out). Relative humidity of the air leaving this unit is directly controlled by temperature of absorption solution.

Heat given off by the condensed moisture, is compensated by cooling coils in the unit. These are maintained at about 45F. in winter, and 65 in summer, by circulation of lake water.

About 10% of the lithium chloride is circulated through a regenerator, where it is sprayed over heating coils that evaporate the moisture into a scavenging air stream. Regenerated solution then flows to a sump, where it mixes with liquid from the dehumidifier and is pumped back through the system.

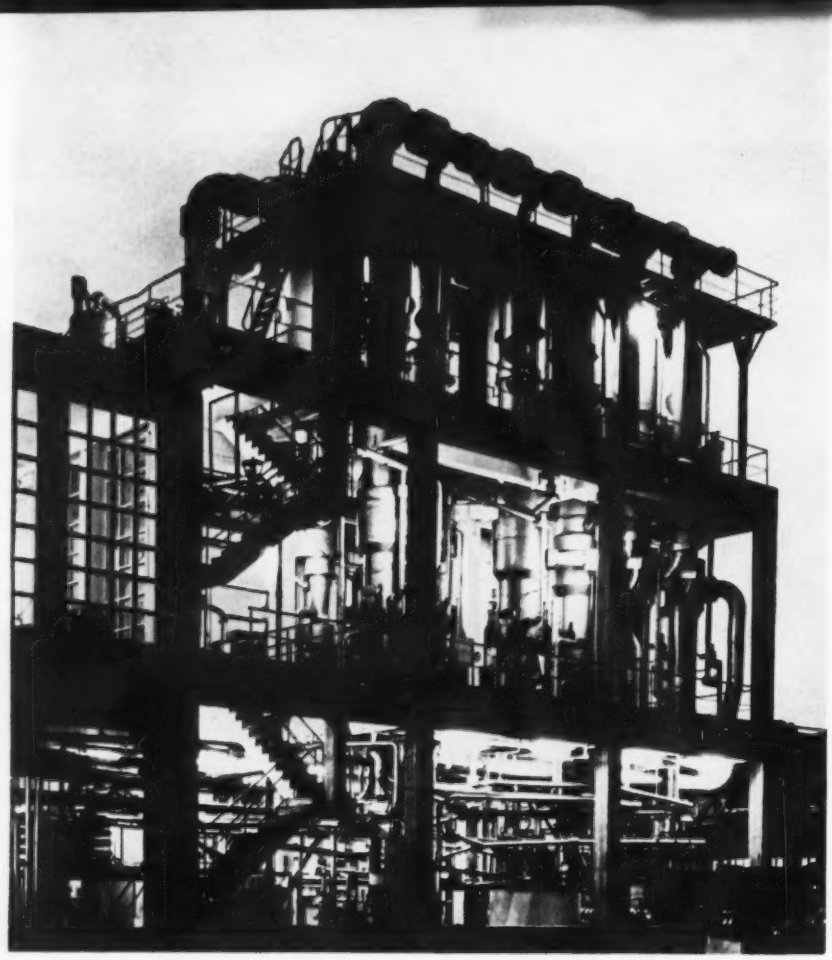
Spotlight on Ventilation

Each level of the process building has an automatically controlled heating and ventilation system designed to maintain a temperature that is within 10 deg. of the outside in hot weather. Supply and exhaust systems are arranged to minimize need for steam heating in winter by recycling the air, particularly from the centrifugal floor to the centrifugal motors and to the air washer in the penthouse.

Although the Kathabar system was installed to provide dehumidified air at constant RH and temperature for granulator drying, some of the air is bled off for granulator-room ventilation purposes, and for use in the Holoflite conveyor system.

The granulation process is monitored from a panel in the control room. Here the operator can control passage of dehumidified air through the granulators by activating or de-activating the Rotoclones (dynamic dust precipitators). The Kathabar system is automatically controlled for operation with the Rotoclones.

The control panel monitors the temperature of air and water flowing into air washer, also the temperature of water supplied to the absorption system. —*End*



OUTDOOR construction is cost-saving feature of Maizena glucose refinery.

MANUFACTURING

Germans Wet-Mill Corn Efficiently

FE REPORTS ON EUROPE

Huge factory speeds processes and ups quality with centrifuges

TO ACHIEVE highest possible purity of corn starch and its byproducts, the wet milling process is used in the Krefeld, West Germany, plant of Deutsche Maizena Werke GMBH, built in 1954. And top efficiency is attained in this huge, 600-ton factory by replacing old techniques with the new.

The milling process produces a starch containing only traces of protein, and it yields gluten which has 75% or more protein. Also, the fiber separated in processing has a minimum starch content. The heavy steep-water concentrate contains all soluble substance.

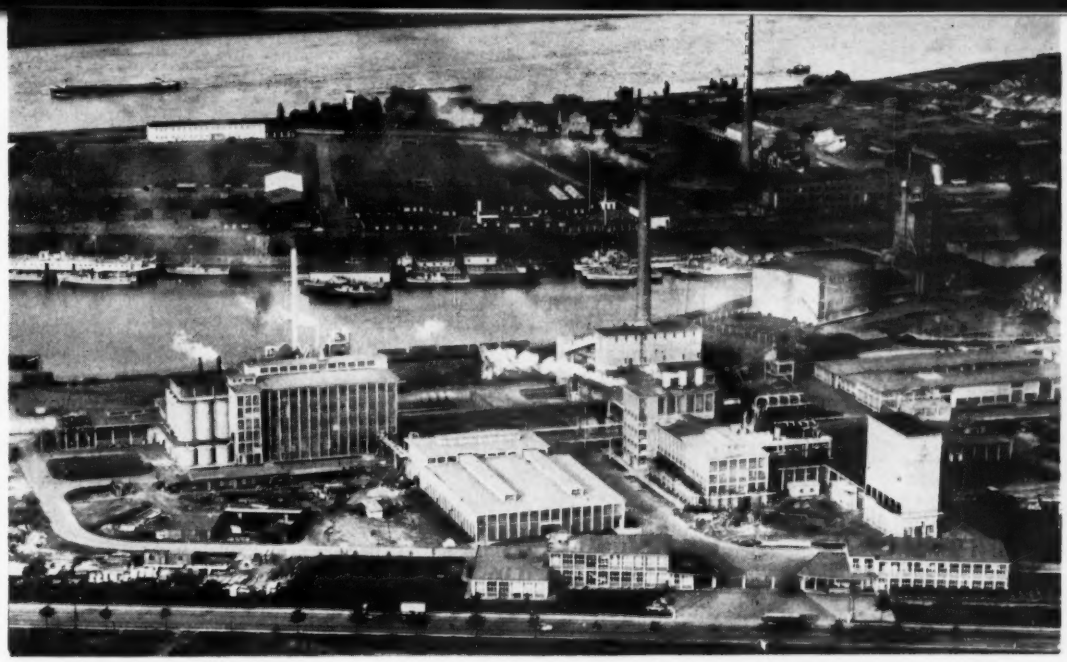
Germs from the corn kernels are recovered for production of corn oil, and gluten and feed are made, as well as starch.

Steeped corn is crushed in a way that the germ can be removed whole from the ground mass by flotation. After washing free of starch in a counter-current system, the germs are dried and pressed in an oil expeller. Oil cake residue goes into feed.

Fibers are washed from the starch in Contessor screen-type centrifuges, which reduce the number of steps in the process from four to two and give better results.

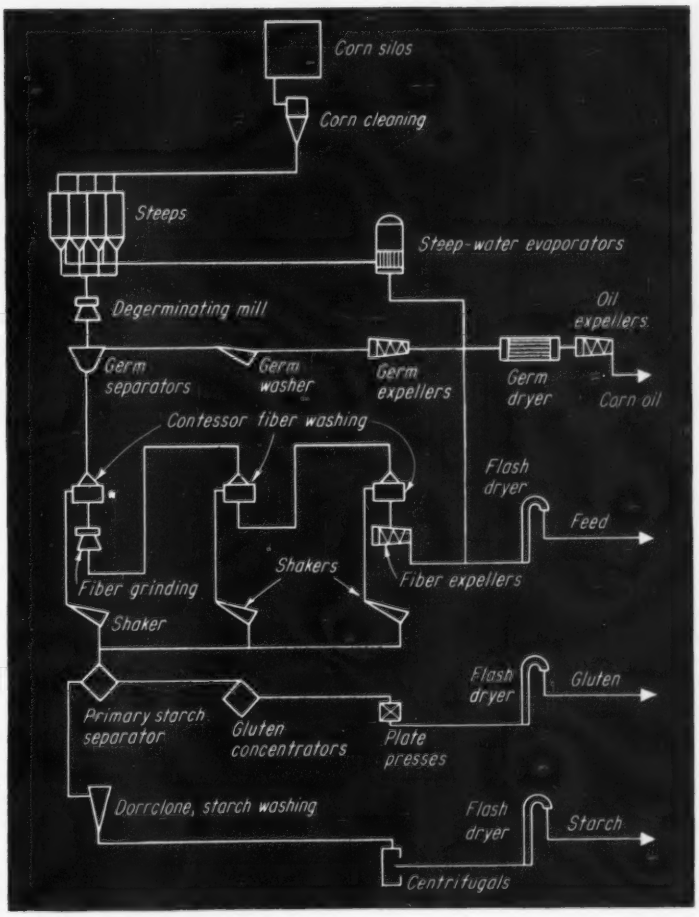
Gluten in the starch milk from the fiber wash is separated by centrifuging, then is concentrated, dewatered in plate process, and dehydrated in flash dryers.

FRANK K. LAWLER
Editor, "Food Engineering"



HUGE CORN PRODUCTS plant with advanced methods is operated by Maizena at Krefeld, on great Rhine River, in West Germany.

HIGH-PERFORMANCE PROCESSES are used to produce corn starch, oil, feed, and gluten at Maizena plant in West Germany.



Gluten-free starch is washed in several counter-current stages to assure the purity necessary for powdered starch, specialty starches, corn syrup, and cerelose. Counter-current use of water in processing corn starch produces best results with a minimum amount of water. And because the operation is a closed one, corn is processed with minimum loss.

Streamlined Separation

Centrifuges have replaced vacuum filters in starch washing because they do a better job and require less labor and floor space. The filters required changing of cloths and removal of cake, and more maintenance. Furthermore, they removed only insoluble material. Centrifuges, on the other hand, require almost no attention, give more uniform quality, and remove both soluble and insoluble proteins.

To eliminate the space-consuming starch tables, Maizena uses a battery of big Westfalia centrifuges (U. S. plants use Mercos).

Filter presses have been replaced by candle filters for removing decolorizing carbon from dextrose. These

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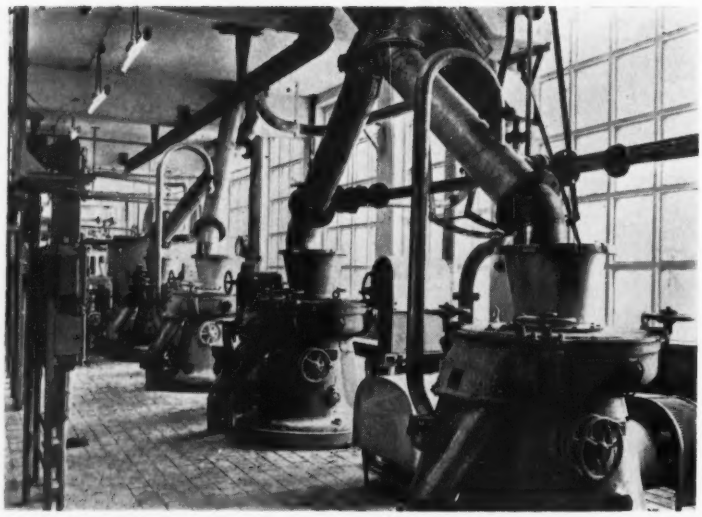


WHOLE GERMS are freed from corn kernels in these preliminary grinding mills, then are separated by flotation.

PROCESSING IS SIMPLIFIED from four steps to two by using these Contessor centrifuges in washing fibers from corn starch.

porous ceramic filters are clean because they are in a closed housing. And the filter cake is easily taken off by flushing in routine operations. Only once a week are the candles pulled from their housing and washed.

Remote switching of filtering operations to save steps and time is set up on a central instrument panel board.

Cost-Saving Construction

Savings in the cost of constructing the starch factory were achieved by not enclosing the frame around the tall steep-water evaporators and the flash dryers for feed, gluten, and starch.

Concrete window sash is a maintenance expense saver. These are wire-reinforced and the cement is vibrated to a high density. They bolt into place, then a prefabricated window is inserted. And all windows are of the same size to reduce cost and facilitate replacement.

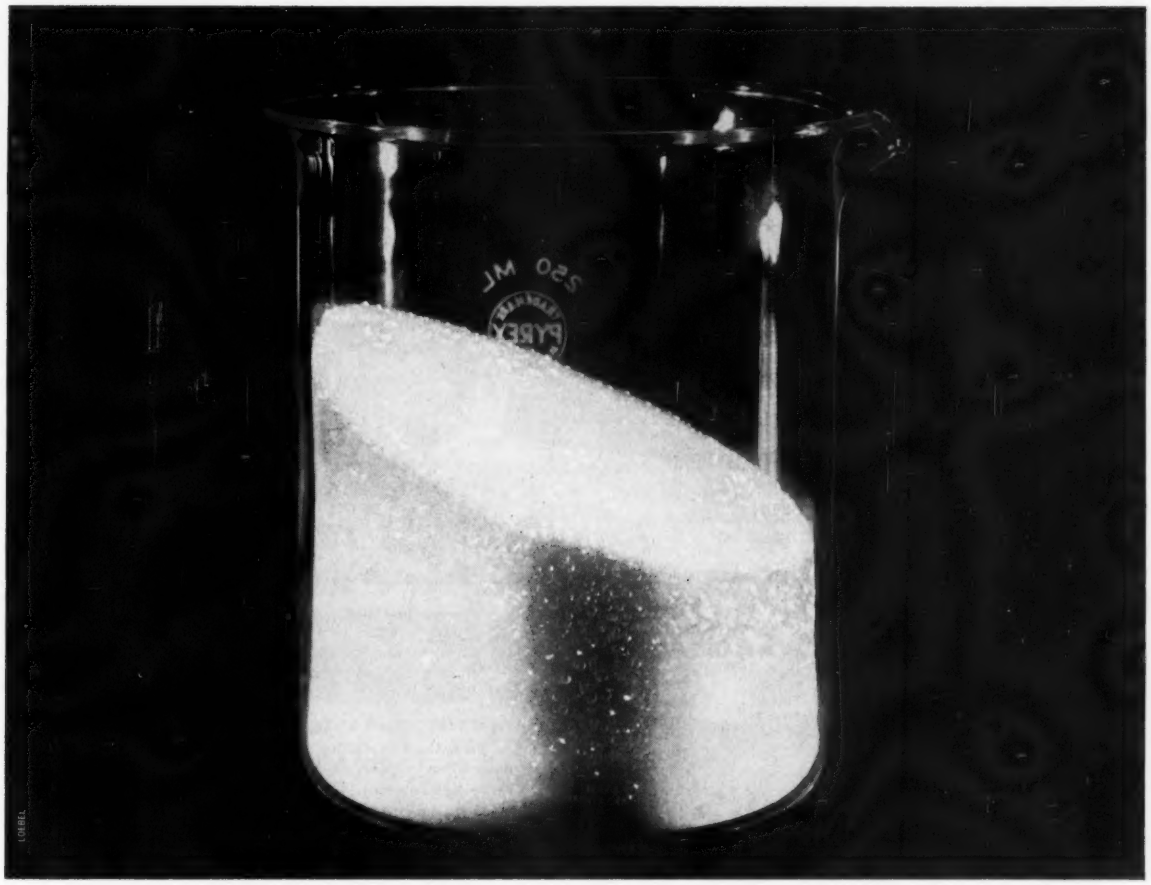
Maizena, now owned by Corn Products Co., employs 600 people, including 100 office workers.

Situated near the banks of Western Europe's great commercial waterway, the Rhine River, it has easy access to low-cost transportation. A main highway and railroad spur also serve the plant.

Operating full-blast and expanding facilities, the huge operation includes two 6-story, two 4-story, one 3-story and one 2-story buildings, plus a power plant and other auxiliaries.

—*End*

SALT OF UNEQUALED QUALITY



■ An increasing number of canners, bakers, meat packers and other food processors now specify Sterling Purified Salt in all their operations. Always more than 99.9% pure sodium chloride (less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals), this remarkable product also offers the distinct advantages of a granulated salt. It is uniform in crystal size—won't "break up" in handling. It has a constant volume for any given weight—can be measured with precision. And Sterling Purified Salt dissolves instantly and completely in every salting operation—thus insuring uniform flavor, color and texture in food. We urge you to test Sterling Purified Salt and compare the results with the salt you are using. You can arrange a test by contacting International's local representative or the nearest district office: **Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Phila., Pittsburgh, St. Louis.** Or write direct to International Salt Company, Clarks Summit, Pa.

INTERNATIONAL STERLING SALT SALT COMPANY

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WASHDOWN HOSE

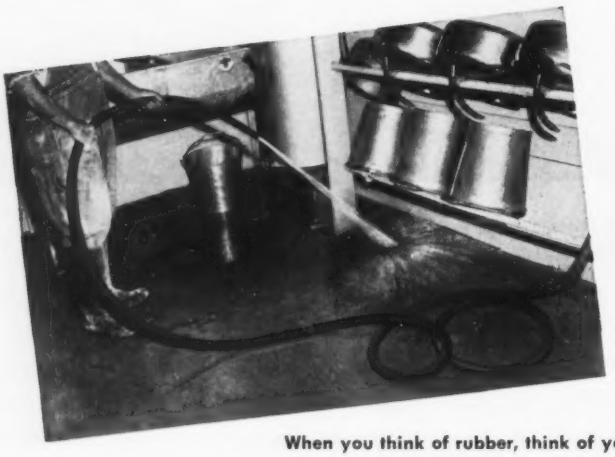
Washdown hose that's never a washout

FOR HOT WATER OR LOW-PRESSURE STEAM

For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-255)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

U. S. PACKER'S WASH-UP (STYLE P-7093) is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

FOR COLD OR WARM WATER



U. S. PEERLESS® WATER HOSE (STYLE P-365) has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse.

This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

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Cleaning, Maintenance Costs Cut With Glass Blocks

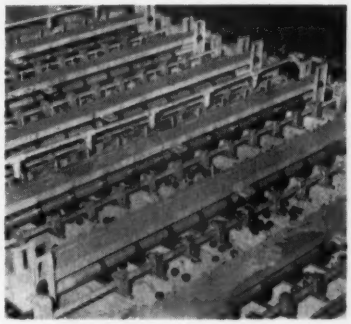
Steel sash, in place 20- to 40-yr. at Ralston Purina Co., Battle Creek, Michigan, was so badly out of shape many windows wouldn't close properly.

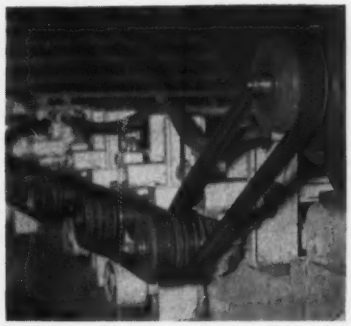
Moreover, the heat from cooking rooms caused condensate to form on windows resulting in a never-ending battle to control corrosion.

Finally a complete replacement was necessary. So three bays were set aside for testing—two with various types of sash, the third with glass blocks and ribbon ventilator sash.

Based on these tests all sash in 311 bays (4 buildings) were replaced with a combination of glass blocks and aluminum sash. Top ⅔ of each bay is glass blocks, lower ⅓ ventilators equipped with screens.

Blocks (Pittsburgh Corning) have smooth inner faces that permit easy cleaning. Caulking, painting, etc., is also eliminated as blocks are mortared into place. Additional phases are their insulating factor—equal to a 12-in. concrete block wall—and their blue-green "Suntrol" diffusing screen that cuts down instantaneous heat gain and glare.





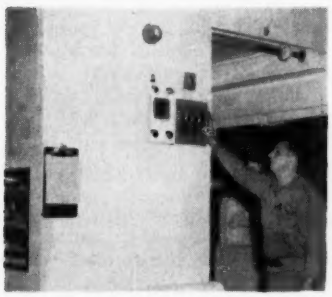
V-Belts Pack Power for Fruit Job

Breaking clusters of cherries attached to a common stem made hand sorting thousands of bushels an expensive, time-consuming operation at Oneto & Gotelli Bros. farms, Stockton, Calif.

To obviate this they developed the cluster-cutter (left photo). Unit consists of 9 shafts, on each of which are 12 circular saws, in staggered positions, revolving at 2,000 rpm. Cherries pass beneath saws on a 48-in.-wide belt. Probes that extend from a point next to the saws snag and elevate the clusters so they can be cut apart.

Problem faced by company engineers was how to obtain a drive that was adequate to transmit power to the 9 shafts, but compact enough to fit in restricted locations. Solution was use of sheaves and V-belts (Dodge Mfg. Corp.), capable of handling up to 3-times the hp. of standard drives in a given space.

A 1½ hp. Reliance motor provides power. It and all shafts are fitted with Dodge Dyna-V sheaves and Dyna-V belts (right photo). Power from motor to first and second shafts is transmitted by dual belts. Remaining 7 shafts are turned by single belts.



Panel-Mounted Switches Up Dough Production

To improve production, save operator's time, and obviate cleaning motor starters on individual machines, we automated our bakery make-up operations. Dough divider, rounder, overhead proofer and molder-panner now are controlled from a centralized, dust-tight panel board and an automatic, sequential operating system. The panel (photo), mounted on the proofer, has start-stop buttons for each machine, pilot lights and manual-automatic selector switches. An overriding key-switch safeguards personnel and machines.

With switch in automatic position, the four machines start/stop in sequence. If dough-pieces or pans jam, all units are stopped manually by pushbutton at molder-panner. When cleared, another button starts last unit (molder-panner) first and, in reverse sequence, the other units.

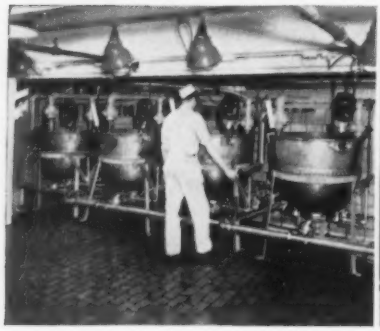
Another production aid is a counter, installed at our proofer, for counting a predetermined number of dough pieces of bread varieties. Errors occurred when we depended on a counter conventionally located at the divider, because here it required some mental multiplication by the operator. The new one is connected with a photo-switch and is located where dough-pieces enter proofer single-file. When a pre-set number of pieces pass switch, a bell rings and operator re-sets the counter for next variety.—*Minos Asproyerakas, V.P., Chief Engr., National Baking Co., Chicago, Ill.*

Built-In Corrosion Protection

Clean-up water, if it seeps under ovens, causes corrosion and foul odors. To avoid this, we installed our Petersen ovens on 2-in. elevated concrete slabs which extend 3-ft. out from the oven's sides to a 2-in. curb. Both floor and slab are topped with green quarry tile. We hand-mop the

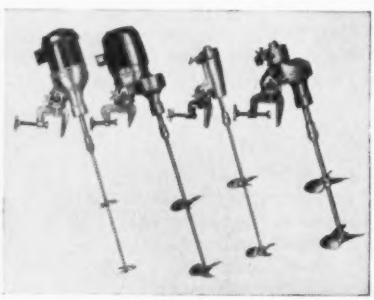
How to choose a portable mixer

To get your money's worth, ask yourself these questions...



1. Will it mix my materials efficiently? Your mixer must set up just the right *balance* of fluid flow and turbulence for the result you want. You get this balance with a LIGHTNIN Portable Mixer. Selected by scientific methods, it's *guaranteed* to do the job right.

2. How is the shaft supported? Is the mixer built to protect the motor against the strain of radial shaft loads? You'll find this vital safeguard in LIGHTNIN Mixers. An extra ball bearing here steadies the shaft for true running—adds years to motor life.



3. What about adjustability? You can quickly swing a LIGHTNIN Portable to any angle for the exact kind of mixing you want—slow roll, vortex, or rapid top-to-bottom turnover. Universal ball-and-socket clamp tightens without wrenches—stays tight.

4. How much choice do I have? With LIGHTNIN Portables you can choose from *thirty* models, ⅛ to 3 HP. Direct or gear drive; electric or air motor. Shafts and propellers in all alloys and coverings. There's a LIGHTNIN Mixer to handle any job.

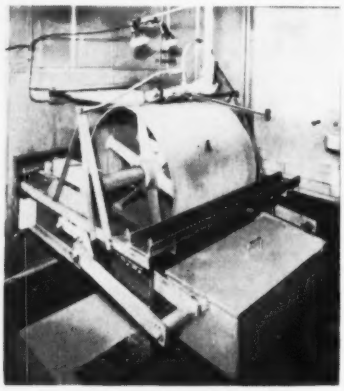
5. Where can I get prompt service on fluid mixing? Just call your LIGHTNIN Mixer representative. He can quickly give you a guaranteed recommendation. And he's near you—look him up in Thomas' Register or the yellow section of your telephone directory. Or write us direct.

LIGHTNIN®
MIXERS AND AGITATORS
MIXCO
Fluid Mixing Specialists

MIXING EQUIPMENT Co., Inc., 143-e Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

slab and power-scrub floors with a Lincoln 30 in. scrubber. An added benefit: Mobile racks strike the curb —never bump against and damage ovens.—*Minos Asproyerakas, V.P. and Chief Engr., National Baking Co., Chicago, Ill.*



Better Ice Cream Handling With Wide Stainless Belt

At High's Ice Cream Novelties, Memphis, Tenn., a 28-in.-wide x .032-in.-thick stainless steel belt (A in photo) was incorporated in the recently installed Eskimo Pie line to insure smooth, uninterrupted operation, and maximum sanitation.

Made by Sandvik Steel, Inc., Fair Lawn, N.J. this belt passes through a 54-ft. long −45F. hardening tunnel at speeds of 1-6 ft./min. Extruder head (B) deposits 4 continuous ribbons of ice cream onto the belt just before it enters tunnel. At discharge end, frozen ribbons leave belt and move to knife that cuts them into slices of desired length for chocolate coating.

Belt is driven by ½ hp., variable speed motor, so is easily synchronized with the 6 other integrated

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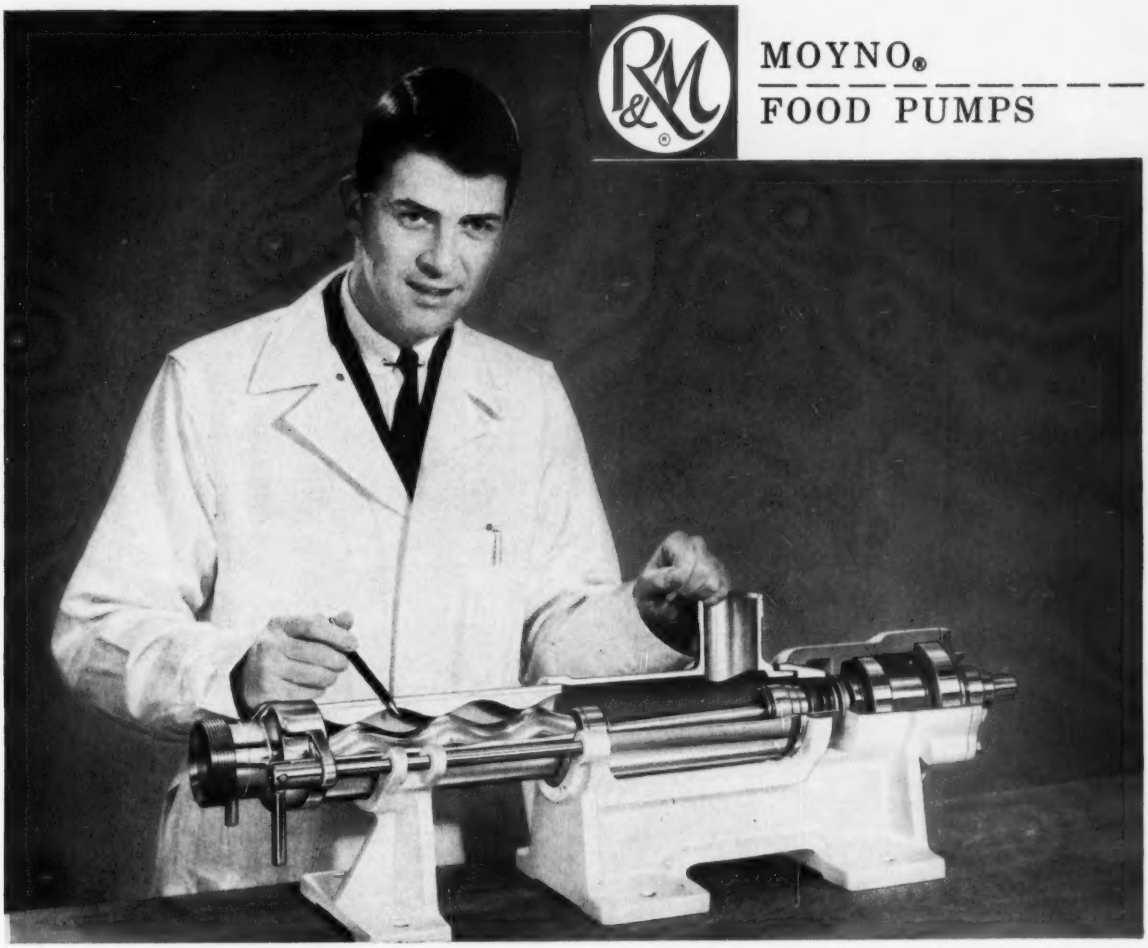

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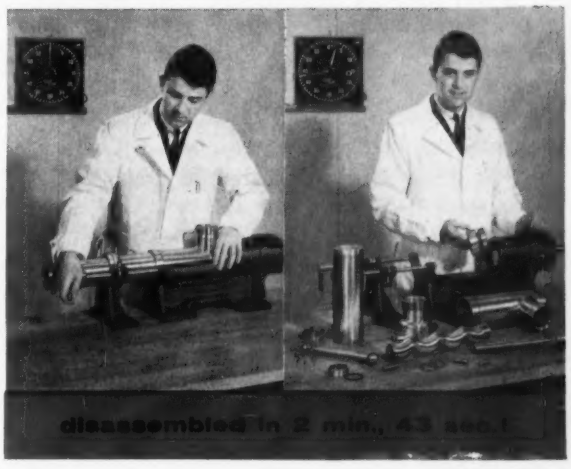

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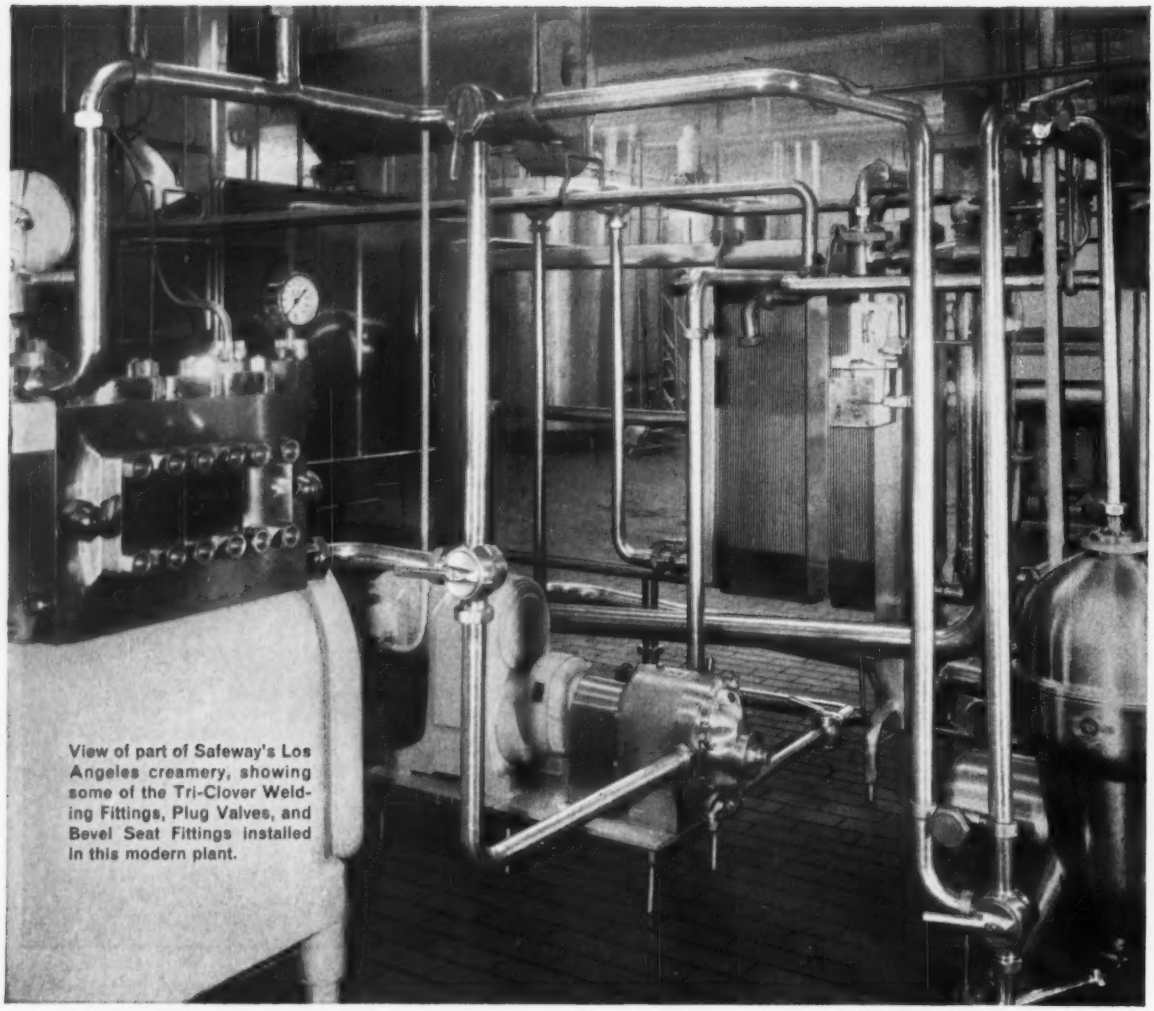
CIRCLE 65 ON READER SERVICE CARD 65



View of part of Safeway's Los Angeles creamery, showing some of the Tri-Clover Welding Fittings, Plug Valves, and Bevel Seat Fittings installed in this modern plant.

SAFEWAY STORES' MODERN CREAMERY

utilizes TRI-CLOVER WELDING FITTINGS and VALVES

Safeway Stores have long been known for modern self-service retailing and efficient operations. In keeping with these progressive methods, their modern creamery in Los Angeles, California, was carefully designed for "streamlined" processing.

As part of its flow design, Safeway installed numerous butt welded stainless steel liquid lines where Tri-Clover "TRI-WELD" welding fittings were used, together with Tri-Clover Plug Valves for directional control in this plant.

Welding on these lines was done right on the job, with newly developed welding machines.

This is another good example of the way in which Tri-Clover fittings and valves "keep pace" with modern processing methods that are being developed by the country's leading dairy and food plants. Let our engineering department help plan your next processing or "C-I-P" installation.

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units comprising "pie" making system. It has limit switches at each side of discharge end that actuate warning lights in case belt moves too far to one side or the other.

As it rounds drive pulley, belt is sprayed with Cl solution, then wiped by two squeegees, keeping it constantly clean and eliminating need for wash-down at end of shift. Constant tension from a counterweight compensates for expansion or contraction of the metal due to changes in temperature. —*FE Staff*

Flat-Top Conveyor Is Tough

Conveyors exposed to corrosive environments such as hot pickle brines (photo), must be fabricated of special materials. This one is molded of Delrin acetal resin (Du Pont).

It is less than one-third the weight of steel, has an estimated normal service life of two to four times that of metal conveyors, does not corrode, and requires no lubrication.

The unlubricated chain was operated daily for 9-months, immersed in 170F. pickle brine. Results showed no warpage, practically no stretching, very little discoloration or wear. Only maintenance required was tightening of two lines of the chain.

PRACTICAL TIPS

Replacement of roof drainage components, such as gutters and downspouts are frequent and costly in industrial smog areas. When made of stainless steel, they withstand corrosive industrial gases, support heavy loads of snow, and last longer than many other types.

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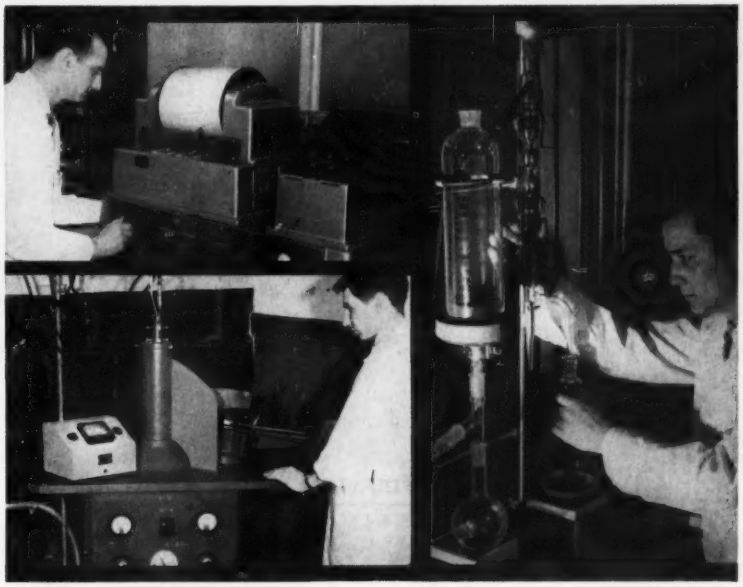

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CIRCLE 67 ON READER SERVICE CARD 67

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WALLACE & TIERNAN INCORPORATED
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Teletype Order-Processing

(Continued from page 45)

A tape-punching machine (6) makes up a copy of all orders on a continuous 5-channel tape that's airmailed to the Park Ridge data-processing center. This serves as the basis for invoicing as well as for statistical records.

The tape is fed to an IBM tape-to-card converter (7) to form the basis of statistical records that include names of customers and salesmen as well as a recapitulation by district offices and totals for company.

Since the data on tapes is transferred onto punch cards, the new method saves a step in data processing. Previously, cards had to be manually key-punched from invoices.

A converter punches two sets of cards—detail (or product) and customer (or header). There is a detail card punched for each item on an order, and it contains information on product code, quantity, shipping instructions, and reference number (for sorting).

The card is matched with a master deck with data on customer's name, address, shipping instructions, etc. Prices and quantities are then extended on an electronic multiplier.

Header or customer cards are similarly processed, then merged with detail cards. From here, they are run through a printer (8) to write invoices, and then routed to customers, salesmen, district and regional offices. Product cards are separated and held until the end of the month for preparation of monthly delivery and volume reports.

Step-by-step, GM is further improving the integration of its data processing facilities. Delays caused by paper handling and work duplication were significantly reduced by combining the new system with automated data-processing equipment to speed transmission of orders from district offices to Buffalo and then to Park Ridge for invoicing and statistical records. Leasing costs for the wire system (per 8-hr. day) run about $3,000 a month.

Basis of the integration, points out Methods Manager H. L. LaFayette, is the use of a common language—TOPS "talks" through its punched tape to Park Ridge's punched card machines.

After the new system completes its shakedown period, GM will consider its installation in other distribution centers. Wire mileage will be a key factor in this consideration.

—*End*

CIRCLE 68 ON READER SERVICE CARD

CIRCLE 69 ON READER SERVICE CARD→

"Knox furnishes us the packages that sell," say executives of major olive and pickle packer

"When packed in glass, stuffed olives—with their eye-catching colors—are a real stop signal to grocery store shoppers," says the manager of the olive department of one of America's leading food packers,* a major user of Knox glass.

"In our olive department, for example, 85% of the glass jars we use—in nine different sizes—are Knox products.

"We take full advantage of Knox's quality and clarity by hand-packing our olives in patterns that give maximum package attractiveness. We've found that this, plus proper display in the store, can increase a grocer's olive sales by ten to fifteen percent."

*Name available on request.

The manager of the same company's pickle department says: "In modern supermarkets, the product has to sell itself. That's why we use glass—to take advantage of impulse buying. Knox's quality glass can take the strain of the packing process—including the thermal shock of pasteurizing—and still give us the best available sales package."

Find out how Knox's quality product, reliable delivery, and outstanding service can play an important role in increasing your sales by furnishing the package with maximum shelf-impact. Contact Knox Glass, Inc., Knox, Pa., or any one of Knox's 37 sales offices.

the new / **KNOX GLASS**

WANT TO TURN MAINTENANCE DOLLARS INTO PROFIT DOLLARS?

Tom Robertshaw can show you how. Tom's a paint expert—one of a growing force of specialists that constitutes Du Pont's Technical Service Group. His mission: to help you pare down the high cost of maintenance painting. As he sees it:

"Every maintenance dollar you save is a profit dollar. Of course, to insure maximum return on your investment, you've got to begin with quality paint. Too many maintenance men have learned the costly lesson that price-per-gallon as a measure of economy can be mighty misleading. When you specify Du Pont, you're getting the best paint available, backed up by proven performance in the field.

"However, that's only half the story. To bring down the cost of protecting your equipment—and keep it down—the right paint *system* is vitally important. Here's where Du Pont technical competence really pays off. We see to it that the system you employ is specifically suited to your needs. Our recommendations, based on a thorough study of your particular problem, cover everything from surface preparation and paint selection to the most efficient methods of application. We'll show you, too, how to use color effectively to improve plant appearance and promote safety. It adds up to this: lasting protection and longer service life *at lowest cost per square foot per year.*"

There are men like Tom Robertshaw working out of Du Pont district sales offices from coast to coast. Why not let one of them put his training and experience to work for *you?* Call the office nearest you, or write: E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Dept. FE-65, Wilmington 98, Delaware.

* * *

Thomas J. Robertshaw began his career with Du Pont in 1938. Following wartime Navy service as an Aircraft Finishes Specialist, he returned as Assistant to the Sales Technical Advisor in Philadelphia. In 1952 he was made responsible for Maintenance Sales in New England and upstate New York. Since 1957, he has been Central District Manager, Industrial Maintenance Sales. Among the industries for which he has solved maintenance painting problems: marine, automotive, chemical, steel, petroleum and food.

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SPISOSEALS are a line of powdered spice flavors based on spray dried oils and oleoresins, precisely formulated for use as alternates for crude spices, essential oils and oleoresins, solubilized oils, and dry solubles. There is no form of seasoning with finer, more well rounded flavor, nor any with such ease of handling.

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SPISOSEALS may be custom formulated to replace any blend of spice flavors you are now using . . . We invite processors of quality food products to sample this new line of premium quality seasonings. Send your request to D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J.

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PALLETIZED CASES of empty cans are automatically transferred from trailer to the accumulating conveyor that holds 32 pallet loads.

ENGINEERING & TECHNOLOGY

Brewery With a Better Flow

Handling today will make or break you. That's why you'll welcome a look at Anheuser-Busch's striking new system for receiving empty containers and transporting finished product to shipping.

HANDLING SHIPMENTS of incoming empty containers and outgoing cases of filled ones in a brewery can be costly, fatiguing business. Especially with a battery of filling machines that can't afford to wait for the empties. Different types of outbound cases with a variety of product brands (and labeling) also complicate the problem.

Anheuser-Busch, Inc., St. Louis, has met these tough requirements through installation of a $2 million palletized case-handling facility.

This ultra-modern system, which was installed by company engineers, was especially designed to cut empty container handling and distribution costs, and provide better service to wholesalers. Empty cans arrive by truck, bottles by truck and railroad. Filled cans and bottles go out by truck and RR cars.

Here's the necessity that mothered the new installation:

1. Increased handling capacity became imperative in face of multiplying shipments.

2. No additional shipping space was available at the bottling plant. So unitized loads of outgoing products had to be conveyed beneath a street to a new shipping building. New system's geared to handle 123,000 cases during a 24-hr. period and a maximum of 60,000 during a 8-hr. period.

3. Need to "go automatic" by conveyor and fork truck movement of palletized cases instead of continuing with costly method of handling individual ones.

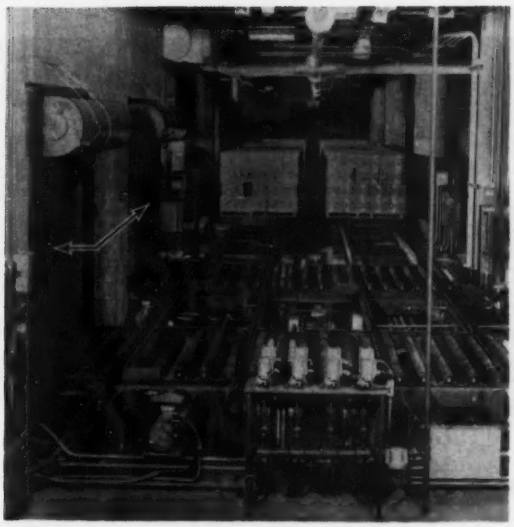
4. Unloading and loading distributors' trucks at the same spot. Used to be that trucks had to lose time waiting and jockeying from position-to-position, first to unload and then to load. Now unloading and loading are accomplished in considerably less time than formerly.

Palletized handling of empties is accomplished in several ways. One involves unloading and feeding empty cans from manufacturers' pallet loads at an unprecedented degree of speed and automation. The other features unloading and feeding reusable bottles from distributors' trucks to soaker-washers.

Empty cans are received in reshippers or in bulk. Latter does away with manual dumping, cuts manufacturer's packaging and handling costs. Both methods reduce in-plant handling and storage of empties.

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

UNSTACKER lifts off top pallet, then transfers the two individually to one of two tray elevators.



PALLET LOADS of empties are shunted from tray conveyors (arrows) to accumulating system.

System wouldn't have worked efficiently if company engineers hadn't designed a number of safeguards into it. Along the conveyors are "anti-back up" limit switches and photoelectric eyes that prevent jamming of palletized cases.

Suppose, for example, that a conveyor line is filled all the way from feed end to limit switch at tail-end transfer point. Further pallets arriving would be halted on conveyor, which might cause jamming. When pallet hits limit switch, switch is actuated to stop motor driving conveyor. Therefore, no more pallets can enter conveyor, and jamming is eliminated. Same switch will also drop transfer conveyor's rollers to permit chain to carry load to next station.

Suppose, too, that a conveyor must accumulate a certain number of pallet loads at another transfer station. Here a switch is hooked to an electric-eye. After a pre-set number of pallets have been assembled, the electric circuit activates accumulating and feed conveyors. Conveyor and control systems then re-cycle to accumulate another train with the same number of pallets.

"Eyes" also stop and start conveyor motor whenever a fork truck picks up and removes a pallet-load. As truck is driven to pick-off station, it breaks a beam to interrupt circuit and stop conveyor. On backing up, beam's no longer interrupted so conveyor starts running. In other cases, eyes and switches spot a moving load, prevent movement of another load onto same conveyor.

Safeguards have also been engineered into the new system through installation of 96 gear reduction drives (Faulk) and magnetic clutch brakes (Warner). They're hooked to motors driving each conveyor section. Their job: To control acceleration and deceleration of the motors, thus preventing abrupt start-stops that topple cases on a loaded pallet.

Unitized handling of empty and filled containers is a two-part story. We'll first show how system breathed new efficiency into the receiving department.

How system works. Starting point of system is at indoor unloading dock. Manufacturers deliver cans in reshippers and bulk pallet loads (stacked seven layers of 16-oz. cans —360 per layer), in which special trailers are timed for brewery dock arrival. Each load consists of 32 pallets (2x2x8 ft.). Trailer is equipped with two sets of side-by-side gravity rollers with center motor-driven chains (Alvey) built into floor (diagram). These transfer entire load to brewery's receiving-accumulating conveyor (Matthews) in approximately 2 min. (point 1, Fig. 1, p. 74).

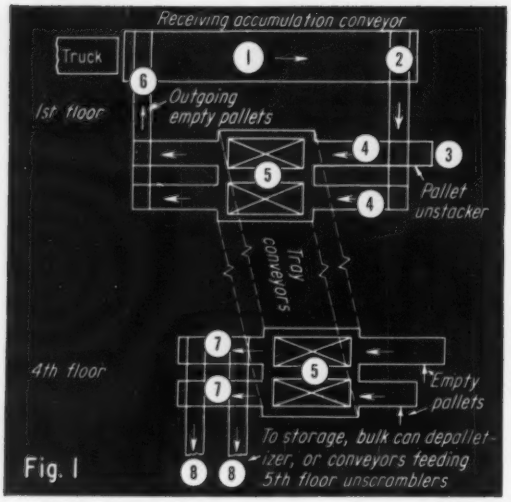
When first group of four pallets reaches end of conveyor, roller-type limit switches are activated to stop conveyor. At this point, rollers of transfer conveyor (2) drop, and a chain conveyor carries the 4-pallets to two pneumatically-operated, chain-driven destackers (3).

Pallet loads move at 60 fpm. and separate into two units, each tripping limit switches that activate the destacker. Its pneumatically operated arms secure top pallet, which is elevated by motor-driven chain. Bottom pallet is then fed by one of a pair of roller conveyors (4) for fourth-floor delivery by one of two specially designed tray elevators (5). Then destacker's hoist lowers top pallet onto roller-feed conveyor, arms retract to strike limit switch that readies it for next group of pallets.

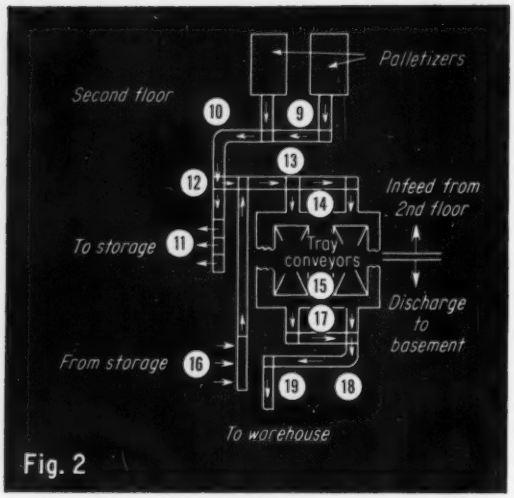
Floor-to-floor movement. A series of eyes and switches control feed of single pallets from unstacker to one of two tray elevators (Gifford Wood). Each elevator consists of eight chain-driven trays that deliver one pallet load at a time to 4th floor at rate of about 2¼ pallets per min.

Operation of tray conveyors is periodically reversed to return stacks of empty pallets from 4th to 1st floors. Photo-eyes and limit switches also control flow of empty pallets, which are carried by series of chain and roller conveyors to transfer conveyor (6) built into infeed of dock's receiving-accumulating conveyor (1). When limit-switch is activated, transfer's rollers raise and feed empty pallets into outbound trailer.

Continued on next page



CAN HANDLING SYSTEM automatically transfers empties from trailers to storage or points of use. (Numbers key to details in text).



FILLED CASES move smoothly from palletizers to storage area in the company warehouse. (Numbers key to details in text).

To filling machines. Upon arriving on 4th floor, pallet activates roller switch to "walk" it from tray conveyor by means of live rollers (7). Each live roller consists of two transfer conveyors for uninterrupted automatic feeding of pallets to one of two accumulating conveyors (8). Each accumulator consists of four sections of chain conveyors separated by pallet-load stabilizing rollers (2½-ft. long) for movement and storage of 32 pallets.

Upon reaching end of last conveyor section, pallet activates a roller switch that stops chain. Photo-eye interrupted by fork truck also halts conveyor, releasing it when loaded truck backs away. Trucks haul pallet loads of reshippers either to storage or onto four feed belts (three for 12-oz. and one for 10-oz. cans). Reshippers are manually transferred from pallets and onto the four inclined conveyors feeding 5th-floor can unscramblers, washers and fillers.

Stacks of empty pallets are picked up by fork trucks and loaded onto live rollers that feed them, stack at a time, to tray conveyor (5). Stacks then travel to first floor for discharge onto a series of conveyors (6) feeding outbound trailers.

Handling bulk cans. When system receives bulk pallet loads of 16-oz. cans, fork truck transfers them from 4th-floor accumulators (8) to semi-automatic depalletizer (not shown). Operator removes taped corrugated boards protecting sides and top of pallet load. Then pallet is conveyed to depalletizer that's activated by trip of a limit switch.

Layer-by-layer destacking is achieved through pushbutton operation. Unstacking's accomplished by a lift mechanism that elevates pallet so that bottom of top layer is flush with wide accumulating belt. Tripped limit switch stops lift, and chain-operated arm brushes top layer of cans onto belt. As arm retracts, operator removes paper board sheet separating layers of cans. Succeeding layers are elevated and swept onto belt in a similar manner.

Empty pallets are stacked for fork-truck transfer to tray elevator. Empty cans are transported by gravity tracks and conveyors to filling machines.

Empty re-usable bottles are returned to shipping department (built into the outbound filled container-handling system) by distributors' trucks. Pallet loads are fork-truck transferred onto conveyor feeding carton unstacker (Standard Conveyor). Unstacked cases are single-filed and conveyed to case unloader (Meyer), from which empty bottles are supplied to bottle-washer for delivery to filling machines.

Handling filled containers. Management also flashed the green light for advanced handling of palletized case-packed bottled and canned beers. Result: An entirely new materials handling system, with no relics of the old except direct conveying of cases (from seven palletizers) to indoor RR spurs.

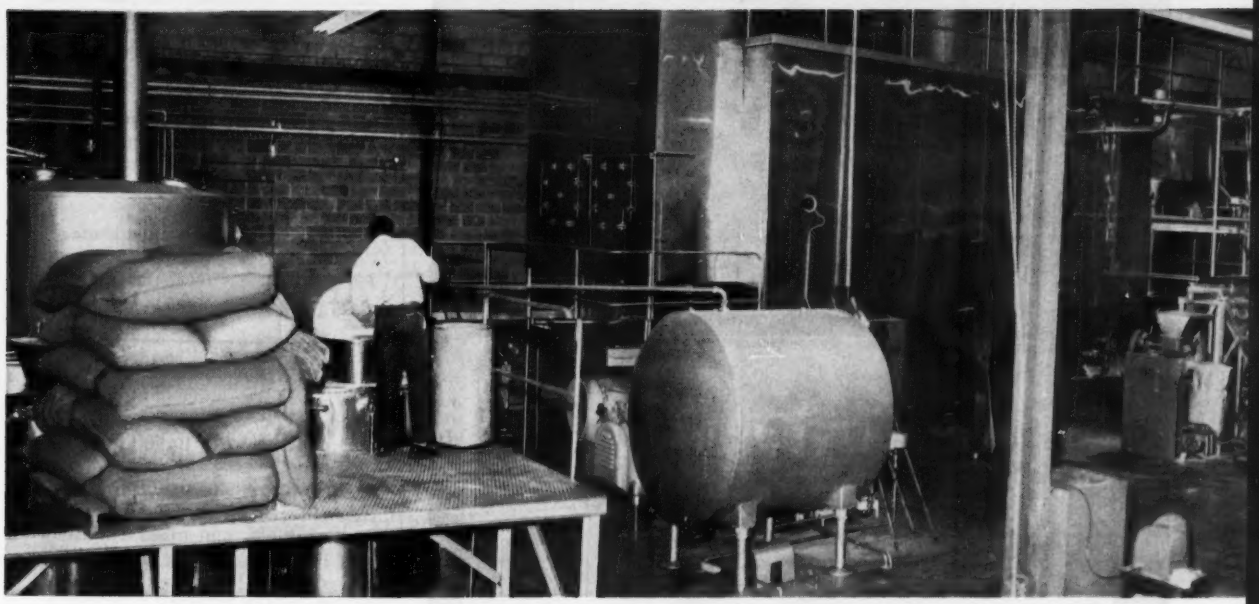
System starts with discharge of pallets from two 2nd-floor palletizers and onto chain conveyors—(9) in Fig. 2. Pallet trips limit switch that raises pneumatically-operated roller transfer feeding live roller conveyor (10). Movement is in either of two directions—three fork-take-off stations (11) and then to storage or roller-conveyor transfer (12) to chain conveyor (13) and two right-angle roller conveyor transfers (14) to tray conveyors (15).

Each tray conveyor lowers a pallet load at a time to basement. Conveyor also returns empty pallets from basement infeed conveyors to 2nd-floor palletizers.

At basement, pallets are discharged onto live roller conveyors (17). Here, through eyes and switches, collisions are avoided as chain conveyor transfers pallets single-file roller conveyor (18). Pallets are accumulated into trains of six on chain-conveyor sections (19), and transferred a distance of 300 ft. to new shipping-storage warehouse (approximately 40,000 sq. ft.).

Conveyor terminates at three fork truck pick-off stations, each designed to handle two trucks. Here, through eyes and switches, conveyor is automatically stopped and started. Pallets are either stacked two high in storage areas or transferred to one of the 15 loading-unloading docks.

Incoming empty pallets (from carton unstackers) are returned to roller conveyors feeding tray conveyors. Pallets then proceed to any of the nine palletizers. —*End*



STRAIGHTLINE PROCESS starts with blending of raw materials in tanks (left), ends when spray-dried caseinates are bagged (extreme right). Stainless equipment and pipelines insure product quality.

ENGINEERING & TECHNOLOGY

Meets Demand for Milk Protein

New high-capacity facility employs latest equipment, advanced techniques, careful controls to assure plenty of top quality products

PRODUCTION of the high quality animal protein products, sodium and calcium caseinate, was given a big boost last month with the opening of Certified Protein Corp's. new facility in Jersey City, N. J.

Said to be the first U. S. plant specifically designed and equipped for manufacture of high grade caseinates, its initial capacity is rated at 6 million lb./yr. However, ample space was provided in the new facility to increase this output substantially as demand dictates.

New plant employs the latest stainless steel equipment—processing tanks, pipelines, pumps, and spray dryer—to insure against product contamination. And continuous control of temperature and pH during processing further assures product purity and highest protein content.

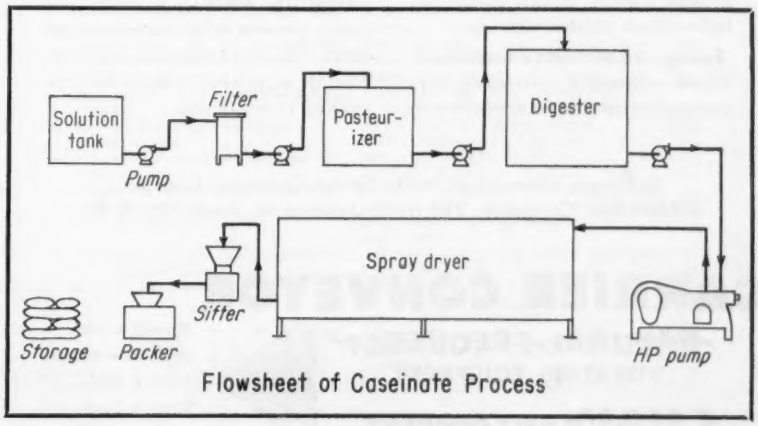
As a result, the spray dried caseinates vary from light cream to white in color and have very little flavor or odor. They contain 88-90% protein that is rich in amino acids.

The process is sufficiently versatile to permit use of milk solids from various sources, either liquid or dried, thus enabling the company to hold its product cost to a minimum.

Two Major Functions

Primary use of sodium caseinate has been in sausage emulsions, where

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"



Flowsheet of Caseinate Process

CASEINATES Are High in Animal Proteins

Characteristics	Analysis
Protein (Nx6.38)	89% minimum
Moisture	4% maximum
Ash	5% maximum
Ether extraction	5% maximum
pH (2% solution)	6.3-6.5
Odor	Clean and bland
Color	White, light cream
Particle size	100% through 120 mesh

it acts as: (1) A binder and fat emulsifier, and (2) a source of high quality protein (1 lb. is said to have the protein content of 5 lb. of lean bull meat).

As binders and emulsifiers, the caseinates tie fat and water together in heat-stable, non-greasy emulsions that are unchanged through smoking and cooking. They also eliminate fat pockets in the sausages.

Recently, however, the outstanding nutritional values of the caseinates have been widely recognized. For example, cereal makers are now incorporating them in—

1. High protein cereals.
2. Special foods (geriatric, infant, diabetic, and dietetic).
3. Spaghetti and macaroni.

Its use in these products is seen soon outstripping applications in meat products.

The functional properties of the caseinates have resulted in their additional use as emulsifiers in whipped toppings and imitation coffee cream, and as replacements for milk serum solids in ice cream, ice milk, dietetic and diabetic frozen desserts.

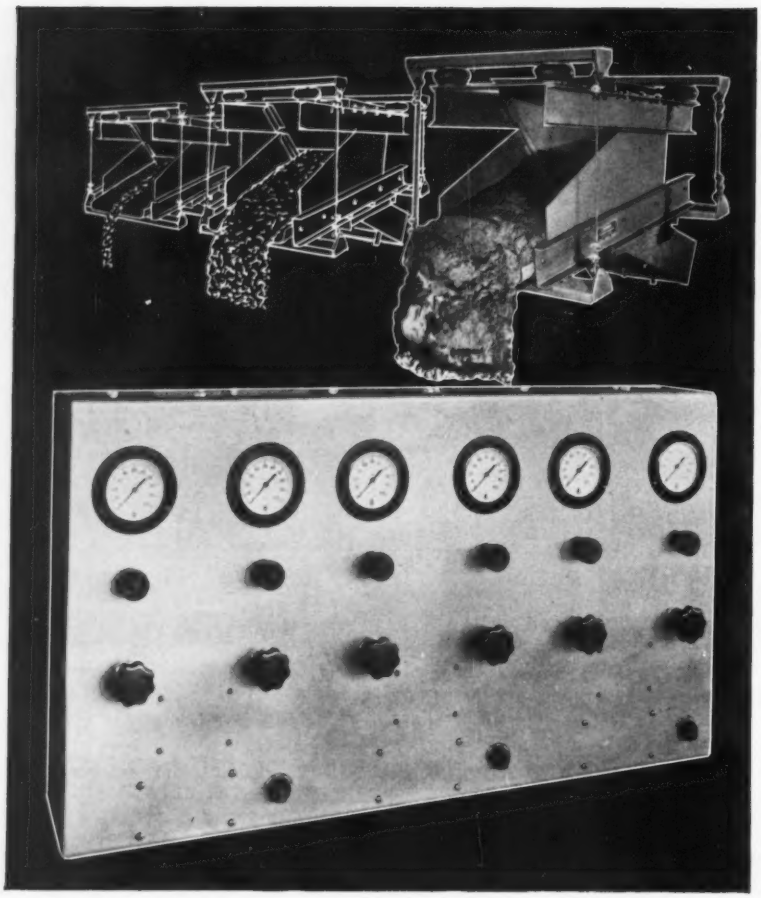
In soft ice cream the products make possible a more stable whip, which is particularly important when a peak is desired. And in ice milk they improve the body and prevent sandiness.

Further, the calcium product enables production of dietetic foods with a minimum of sodium.

Other Uses Seen

Now in the testing stage are a variety of other applications for these versatile products. Most promising are:

1. Use in clarification of white wines and vinegars. Here the caseinates occlude suspended particles and remove them from the liquids.
2. As an air entrapment in chocolate bar goods, and
3. As a fat emulsifier and protein supplement in pet foods. —*End*



From a TORRENT to a DRIBBLE... AMPLITROL means precise control

With Carrier Amplitrol Feeders you can control discharge rates from ANY distance. Carrier Feeders give you precise manual OR automatic control in response to signals from bin-level indicators, process-alarms, scales, load cells, ball mill or crusher drives.

Speed and Accuracy Combined

Three separate Amplitrol Feeders are controlled simultaneously with the control panel shown above. Used in a batch weighing system, the controls produce a fully adjustable high-low feed rate cycle for each feeder. For maximum batching speed with minimum batch variation, Amplitrol feeds the major portion of a batch at torrent rates—the remainder at a dribble. Shutoff at proper weight and recycling is automatic.

For more information, write Carrier Conveyor Division, CHAIN Belt Company, 215 North Jackson St., Louisville 2, Ky.

CARRIER CONVEYOR

~~NATURAL-FREQUENCY~~ VIBRATING EQUIPMENT

CHAIN BELT COMPANY

CONVEY • FEED
DEWATER • SCREEN
COOL • DRY
SCALP • COAT
DISTRIBUTE • ELEVATE

Flood of Additives 'Carried Over'

FDA's Latest Extensions for Direct & Indirect Agents

More Time Granted 31 Direct Additives

In two new listings, FDA has granted time extensions (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials) for an additional 31 direct food additives.

First list (15 additives) follows:

Direct Additives	Limits	Specified Uses or Restrictions
Butyl rubber (chewing gum grade) without inhibitor.	.....	As constituent of chewing gum base.
p-Coumarone	.....	Do.
Coumarone-indene resin	.....	Do.
Estergums (rosin or hydrogenated rosin reacted with glycerin or pentaerythritol and polymers).	.....	Do.
Gums (natural) of vegetable origin	.....	Do.
Isobutylene resin	.....	Do.
Lanolin	.....	Do.
Latex (butadiene styrene rubber)	.....	Do.
Methyl ester of rosin (hydrogenated)	.....	Do.
Mineral oil (including petrolatum)	600 ppm. in total ration.	As a lubricant or dust-control agent in bulk and pelletized animal feed, including salt blocks for animals.
Do	35 ppm	As a protective coating on fresh fruits and vegetables.
Petroleum hydrocarbon resin	.....	As a constituent of chewing gum base.
Polyethylene	.....	Do.
Rubber (natural), smoked sheet, and latex solids.	.....	Do.
Terpene resin	.....	Do.
Wax, microcrystalline, and paraffin*	.....	As a coating on fruits, vegetables, and cheese. As a masticatory substance in chewing gum.

Second list (16 additives):

Aluminum stearate	25 ppm	As a constituent of chewing gum base.
Calcium disodium-ethylenediamine tetra-acetic dihydrate.	25 ppm	As a sequestrant in malt beverages.
Do	75 ppm	As a sequestrant in canned pineapple chunks (nonstandardized article).
Calcium stearyl-2-lactylate	0.5%	In egg white solids.
Do	0.05%	In liquid and frozen egg whites.
Do	0.35%	In nonstandardized bakery products.
Disodium dihydrogen-ethylenediamine tetraacetic acid.	75 ppm	As a sequestrant in canned pineapple chunks (nonstandardized article).
Fat (animal and vegetable), hydrolyzed (free of toxic impurities).	12.5%	In feed for livestock and poultry.
Hydrogen cyanide	25 ppm	As a residue from the use of hydrogen cyanide as a fumigant.
Isobutylene-isoprene	.....	As a constituent of chewing gum base.
Mineral oil	3.3 ppm	As a constituent of defoaming agent used in manufacture of beet sugar.
Polyethylene glycol 400 monooleate	10% of fat content	To emulsify the fat and as defoaming agent in calf-feed milk replacer.
Polysorbate 80	.....	As solubilizer in essential oils.
Sodium lauryl sulfate	125 ppm	As a stabilizer in liquid and frozen egg whites.
Do	1,000 ppm	As a stabilizer in egg white solids.
Sodium nitrite	10 ppm	In cured tuna fish.
Do	20 ppm	In canned pet animal food containing fish and/or meat.
Sodium dodecylbenzene sulfonate	2 parts per million	In fruits and vegetables as residue from its use as a detergent.
di-Starch phosphate (amylopectin reacted with sodium trimetaphosphate).	5%	As a modified starch in food.
Trichloroethylene	10 ppm	As a residual solvent in manufacture of decaffeinated coffee.
Ultramarine blue	0.50%	In salt for animal feeds.

* *Type I: A congealing point of* 160*F. maximum (ASTM D-938), an absorptivity at* 290 *millimicrons of* 0.04 *liter per gram centimeter maximum (ASTM E-131), an oil content of* 1.5% *maximum (ASTM D-721), and a Saybolt color of* 20 *minimum (ASTM D-156). Type II: Absorptivity at* 290 *millimicrons of* 1.0 *maximum, an oil content of* 5.0% *maximum, and a color of* 3.0 *maximum (ASTM* D-1500).

NEWEST TABULATIONS from FDA—covering several hundred more additives—are all in the time-extension category. Some of those given grace are agents going directly into foods, but the preponderant pile of them comprise packaging-material agents—migrant-class adhesive and liner substances.

A number of the latter two types of additives failed to make the lists because they still require specific "identity evaluation."

For earlier listings, readers are referred to FE Jan., p. 81-82; Feb., p. 19-21; Mar., p. 89-91; and Apr., p. 99-101. See also additives story on p. 19 of this issue.

170 Adhesive Agents Given Extensions

Under the heading (c) Substances Migrating From Adhesives Used in Food Packaging, classed as indirect additives to food, the following 170 agents have now been given time extensions (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials).

It is noted from preliminary data that many of these substances may not actually be migratory. However, they are included pending completion of additional requisite scientific checks.

Acetone, Albumin (blood), Ammonium chloride, Ammonium persulfate, Ammonium silicofluoride, Ammonium thiocyanate, Benzol, Benzyl alcohol, Borated dextrin, Borax, Boric acid, Butadiene acrylonitrile latex, Butadiene-styrene latex, Butyl acetate, Butyl acetyl ricinoleate, Butyl benzyl phthalate, Butyl carbitol acetate, Butyl cellosolve,

Candelilla wax, Carbitol, Carbitol acetate, Carbon tetrachloride, Carnauba wax, Castor wax, Cellosolve, Cellosolve acetate, Cellosolve ricinoleate, Cellulose acetate butyrate, Ceresin wax, China clay, Chlorinated biphenyl, Copper 8-quinolinolate, Diacetone alcohol, dibutyl phthalate, Dicyandiamide, Dicyclohexyl phthalate,

Diethylene glycol adipic acid polymer, Diethylene glycol dibenzoate, Diethylene glycol ester of resin, diethyl oxalate, diglycol laurate, dihydroxy abietyl phthalate, Dihydroxydichlorodiphenyl methane, Dimethyl phthalate, Dimethyl polysiloxane, Dioctyl phthalate, Dioxane, Diphenyl phthalate, Dipropylene glycol dibenzoate, Epsom salt, Ethyl acetate,

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Ethyl alcohol, Ethyl cellulose, Ethylene glycol, di (2-Ethylhexyl) hexahydro phthalate,

Ethyl lactate, Ethyl *p*-toluene sulfonamide, Formaldehyde, Formic acid, Gelatin, Glue (animal), Glycerin ester of hydrogenated rosin, Glycol fatty ester polymer, Glyoxal, Heptane, Hexane, Hexylene glycol, Hydroabietyl alcohol, Hydrofluosilicic acid, Hydroxyacetic acid, Hydroxyethyl cellulose,

Isopropyl acetate, Isopropyl alcohol, Tetra-Isopropyl titanate, Latex (natural), Lauryl alcohol sulfate, Lauryl and myrstyl alcohols (sodium salts of sulfate monoesters), Magnesium chloride, Methanol, Methyl acetate, Methyl acetyl ricinoleate, Methyl carbitol, Methyl cellosolve, Methylcellulose, 2,2-Methylene-bis-4-ethyl-6-tert.-butyl phenol, 2,2 Methylene-bis-4-methyl-6-tert.-butyl phenol, Methylene chloride, Methyl ester of hydrogenated rosin, Methyl ethyl ketone,

Methyl phthalyl ethyl glycolate, Mineral oil, Montan wax, Morpholine, Naphtha, Neoprene latex, Nitrocellulose, Oleic acid, Oleic acid and polyethylene glycol, Oxazoline, Ozocerite wax, Parachloroethylene, *a*-Pinene resin, Polyalkylated phenol monosulfide, Polyalkylene glycol ether, Polyamide, Polybutene, Polyethylene,

Polyisobutylene, Polylactyl, Polyoxyethylene oleate, Polyoxyethylene (4-phenol), Polyoxyethylene sorbitan monolaurate, Polyoxyethylene sorbitan monopalmitate, Polyoxyethylene sorbitan monostearate, Polyoxyethylene (40) stearate, Polystyrene, Polyvinyl acetate resin, Polyvinyl alcohol, Polyvinyl butyral, Polyvinyl methyl ether, Propylene carbonate, Propylene glycol monococate, *a*-Protein soybean,

Rosin (decarboxylated), Rosin derivative (dymerex), Rosin, gasoline-insoluble fraction, Rosin glycerol ester, polymerized, Rosin, hydrogenated wood, glycerin ester, Rosin gum emulsion, Rosin methylester, Rosin modified with ammonium caseinate, Rosin, pentaerythritol esters, Rubber (butyl), Shellac, Silica (also colloidal), Sodium alkyl amyl sulfonate, Sodium Carboxymethylcellulose, Sodium decylsulfate, Sodium dioctyl sulfosuccinate, Sodium diodecylbenzene sulfonate, Sodium 2-ethylhexyl sulfate,

Sodium formate, Sodium metaborate, Sodium nitrate, Sodium nitrite, Sodium *o*-phenylphenate, Sodium perborate, Sodium polyacrylate, Sodium salts of dimethyl dithiocarbamic acid and 2-mercaptobenzothiazole, Sodium silicate, Sodium tetradecylsulfate, Sorbitan monooleate, Sorbitan monopalmitate, Sorbitan monostearate, Stearato chromic chloride, Sulfonated castor oil, Talc, Tall oil soaps,

Terphenyl, *o*- and *p*-Toluene ethyl sulfonamide, Toluol, Tributyl citrate, Tributyl phosphate, Trichloroethylene, Triethanolamine, Urea, Urea formaldehyde resins, Xylol, Zinc oxide, Zinc sulfate.

Those That Missed: Cited by FDA are 19 substances omitted from the above time-extension listing.

These additives, says the Agency, must await "evaluation of additional data that will specifically identify the particular substances for which the extensions are requested."

Following are the 19 that remain in question.

Acrylic resins, alkyd resins, alkyl aryl polyether alcohols, alkyl phenolethylene oxide condensates, epoxy resins, ethylene oxide and polypropylene glycol condensates, formaldehyde and aromatic sulfonamides, hydrogenated ketone resin, maleic anhydride-vinyl condensates, paraffin wax (synthetic halogenated), petroleum hydrocarbon resins, phenol coumarone indene resins, phenolic resins, polyacrylamides, polyoxyethylene stearate, polyvinyl acetate emulsions, chlorinated rubber, styrene condensates, and terpene resins.

Extensions for Indirects—Oil, Polyethylene, Wax

Time extensions (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials) also have been granted by FDA for the following three substances as indirect additives to food:

Indirect Additives (a) General List	Limits	Specified Uses or Restrictions
Mineral oil (including petrolatum).....	150 ppm. in food.....	As a migrant when used as a component of packaging materials, excluding confectionery.
Do.....	10 ppm. in food.....	As a lubricant in tableted, capsulated, or extruded food, excluding confectionery.
Do.....	Do.....	As a secondary plasticizing agent, belting, hose, or rollers having food contact, but not to include confectionery.
Do.....	50 ppm. in meat.....	As a lubricant in meat-packing plants.
Do.....	200 ppm. in dried fruits and vegetables.	As a release agent in drying pans in preparing dried fruits and vegetables.
Do.....	1,500 ppm. in bakery products.....	In baking industry as dough divider oil, pan oil, and trough grease.
Do.....	1,000 ppm. in dried egg albumin.	As a release agent in drying pans in preparing dried egg albumin.
Polyethylene.....	.....	As a migrant when used as a component of food-packaging materials.
Wax, microcrystalline, and paraffin (see footnote to wax listing in direct-additives table, p. 77).	.....	As a constituent of food-packaging materials and protective coatings; as a lubricant or release agent.

Further Amendment: Relative to indirect-additive use of Maleic acid (listed FE Apr., p. 99) there has been a change under "Specified Uses or Restrictions," the new reading being: "Not to exceed 0.40% in nitrocellulose-coated, heat-sealing cellophane for packaging foods."

Many Lining Agents Get Grace Periods

Under the heading (d) Substances Migrating From Linings of Containers Used in Food Packaging, classed as indirect additives to food, the following 28 categories of agents have now been given the usual time extension.

This listing, too, is indicated as including many substances which may not be migratory, but which are still subject to additional checking.

(1) Drying oils, including the triglycerides or fatty acids derived therefrom:

Chinawood, Castor (including dehydrated), Tall, Linseed, Oiticica, Beechnut, Candlenut, Coconut, Corn, Cottonseed, Fish (refined), Hempseed, Perilla, Poppyseed, Pumpkinseed, Safflower, Sesame, Soybean, Sunflower, and Walnut.

The oils may be raw, heat-bodied, or blown. They may be refined by filtration, degumming, acid or alkali washing, bleaching, distillation, partial dehydration, partial polymerization, or solvent extraction, or modified by combination with maleic anhydride.

(2) Reconstituted oils from triglycerides or fatty caids derived from the oils listed above to form esters of:

Ethylene glycol, Pentaerythritol, Polyethylene glycol, Polypropylene glycol, Propylene glycol, Sorbitol, Trimethylol ethane, and Trimethylol propane.

(3) Synthetic drying oils:

Butadiene styrene copolymer, and Polybutadiene.

(4) Natural fossil resins:

Copal, Damar, Elemi, Gilsonite, Glycerol ester of damar, copal, elemi, and sandarac, Minyak, Sandarac, Shellac, and Utah coal resin.

(5) Rosin derivatives, including modification by polymerization, isomerization, decarboxylation, and hydrogenation, and methyl ester of hydrogenated rosin:

Rosin esters: Bisphenol-epichlorohydrin (epoxy), Diethylene glycol, Ethylene glycol, Glycerol, Methanol, and Pentaerythritol.

Rosin esters modified by reaction with: Maleic anhydride, Ortho-, meta-, and para-substituted phenol-formaldehyde as listed in following paragraph (6), Phenol-formaldehyde, Calcium resinate (limed rosin), and Zinc rosinate.

(6) Phenolic resins by reaction of formaldehyde with:

Alkylated phenols (methyl, ethyl, propyl, isopropyl, butyl), Bisphenol, Ortho-, meta-, and paracresol, Paracyclohexyl phenol, Paranonyl phenol, Paraoctyl phenol, Paraphenyl phenol, Paratertiary amylphenol, Paratertiary butylphenol, Phenol, and Xylenol.

(7) Polyester resins (including alkyd type) formed as esters of acids—see subdivisions (i) and (ii) below—by reaction with polyhydric alcohols—see subdivision (iii).

(i) Polybasic acids: Adipic,, Dimerized fatty acids derived from oils—see paragraph (1), Fumaric, Isophthalic, Maleic, Orthophthalic, Rosin-maleic acid adduct (petrex acid), Sebacic, Terephthalic, and Trimellitic.

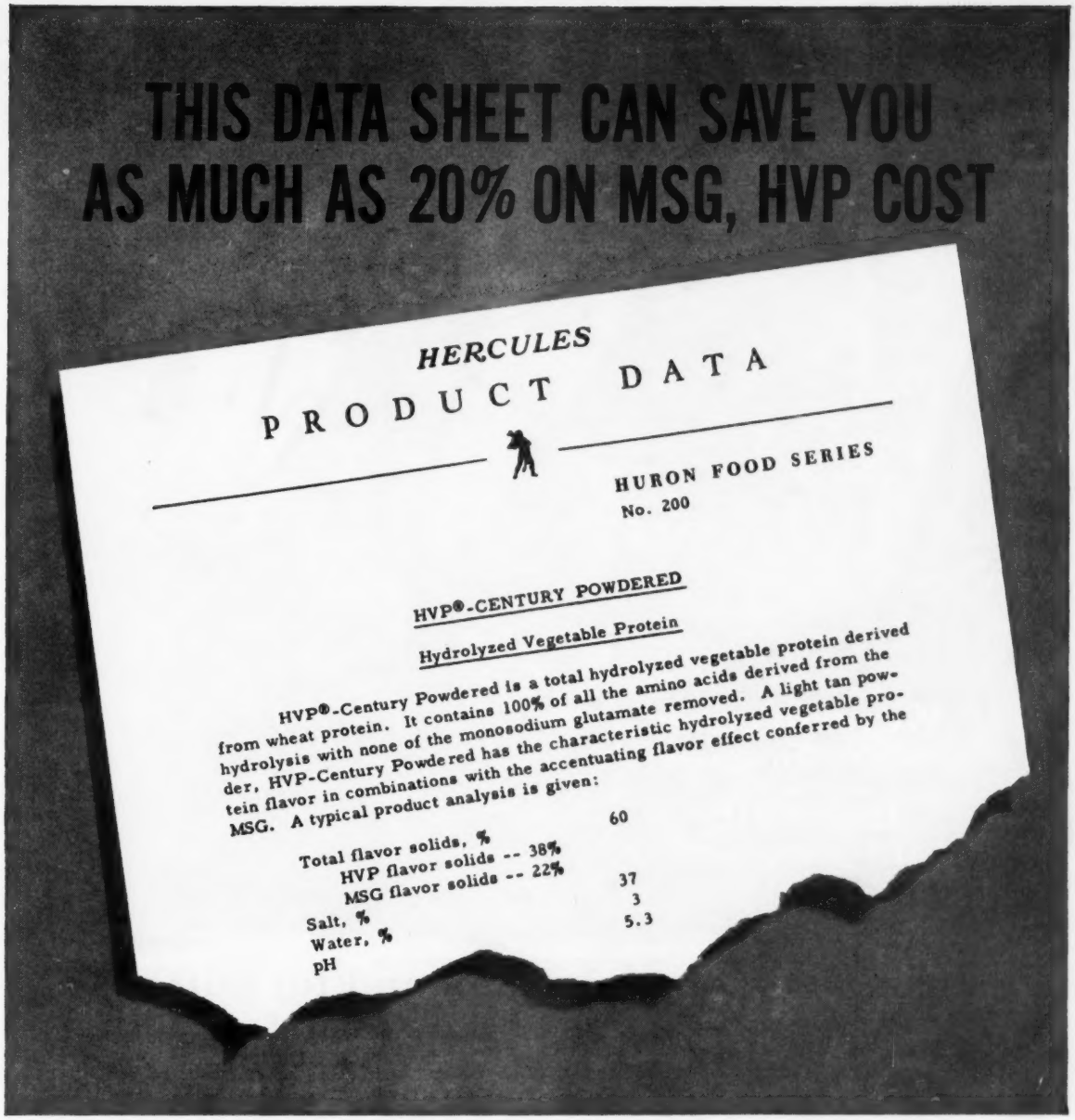
(ii) Monobasic acids: Benzoic, Fatty acids derived from oils—see paragraph (1), Rosins and rosin acids—see paragraph (5), and Tertiary butyl benzoic.

(iii) Polyhydric alcohol: Clycerol, Mannitol, *a*-Methyl glucoside, Pentaerythritol, Propylene glycol, Sorbitol, Trimethylol ethane, and Trimethylol propane.

(8) Epoxy resins: Bisphenol-epichlorohydrin, Bisphenol-epichlorohydrin reacted with drying oils or fatty acids

(*Continued on page 81*)

THIS DATA SHEET CAN SAVE YOU AS MUCH AS 20% ON MSG, HVP COST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PRODUCT DATA
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No. 200
HVP®-CENTURY POWDERED
Hydrolyzed Vegetable Protein
HVP®-Century Powdered is a total hydrolyzed vegetable protein derived from wheat protein. It contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed. A light tan powder, HVP-Century Powdered has the characteristic hydrolyzed vegetable protein flavor in combinations with the accentuating flavor effect conferred by the MSG. A typical product analysis is given:
Total flavor solids, % 60
HVP flavor solids -- 38%
MSG flavor solids -- 22%
Salt, % 37
Water, % 3
pH 5.3

Now—besides its full line of HVP powder and liquids as well as MSG—Hercules offers HVP®-Century powdered, a total hydrolyzed vegetable protein derived from wheat protein. Containing 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed, this new product offers the possibility of cost savings and processing advantages wherever the flavor of well-browned beef is desired.

This new four-page data sheet provides complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. We'll be glad to send you a copy along with a sample of HVP-Century. For information, write to

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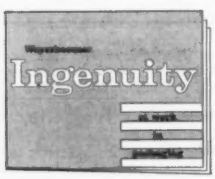

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Additives Carried Over

—see paragraph (1), Bisphenol-epichlorohydrin combined with: Bisphenol-formaldehyde, Diethylene triamine, Melamine-formaldehyde, Phenol-formaldehyde, and Urea formaldehyde.

(9) Coumarone-Indene resin.

(10) Petroleum hydrocarbon resin.

(11) Terpene.

(12) Urea-formaldehyde.

(13) Triazine-formaldehyde resins: Benzoguanamine, and Melamine.

(14) Modifiers (for oils and alkyds, including polyesters): Butyl methacrylate, Cyclopentadiene, Diallyl phthalate, Methyl methacrylate, Styrene, and Vinyl toluene.

(15) Vinyl resinous substances: Polyvinyl acetate, Polyvinyl alcohol (for fatty foods only), Polyvinyl butyral, Polyvinyl chloride, Polyvinyl formal, Polyvinylidene chloride, Polyvinyl pyrrolidone, Polyvinyl stearate, Vinyl chloride-acetate-copolymer, Vinyl chloride-acetate, hydroxyl modified-copolymer, Vinyl chloride-acetate, maleic acid modified-copolymer, Vinyl chloride-acrylonitrile-copolymer, Vinyl chloride-maleic ester-copolymer, and Vinyl chloride-vinylidene chloride-copolymer.

(16) Cellulosics: Carboxymethylcellulose, Cellulose acetate, Cellulose acetate-butyrate, Cellulose acetate-propionate, Ethylcellulose, Ethyl hydroxy ethylcellulose, Hydroxy propyl methylcellulose, Methylcellulose, and Nitrocellulose.

(17) Styrene polymers: Polystyrene, Polymethyl styrene, and Styrene-acrylonitrile copolymer.

(18) Polyethylene (branched and linear)

(19) Polypropylene.

(20) Acrylics and their copolymers: Polybutyl methacrylate, Polyethyl acrylate, Polyethyl methacrylate, Polymethyl acrylate, and Polymethyl methacrylate.

(21) Elastomers: Butadiene-acrylonitrile copolymer, Butadiene-acrylonitrile-styrene copolymer, Butadiene-styrene copolymer, Butyl rubber, 2-Chloro-1, 3-butadiene (neoprene) (with acceptable stabilizer and/or antioxidant), Polyisobutylene (for nonfatty foods only), Rubber hydrochloride, and Styrene-isobutylene copolymer.

(22) Driers made by reaction of a metal—see subdivision (i)—with acid, to form the salt—listed in subdivision (ii).

(i) Metals: Calcium, Cobalt, Iron, Magnesium, Manganese, Zinc, and Zirconium.

(ii) Salt: Caprylate, Linoleate, Naphthenate, Octoate (2-ethylhexoate), Oleate, Palmitate, Resinate, Ricinoleate, Soyate, Stearate, and Tallate.

(23) Waxes: Microcrystalline, and paraffin, Types I and II (see footnote to wax listing in additives table on p. 77), Montan, Polyethylene, Sperm oil, and Spermaceti.

(24) Plasticizers:

(i) Chemical type: Acetyl tributyl citrate, Acetyl triethyl citrate, Aluminum mono-, di-, and tristearate, Butyl stearate, Butyl phthalyl butyl glycolate, *p*-tert. Butyl phenyl salicylate, Dibutyl sebacate, di-2-Ethyl hexyl phthalate, Diethyl phthalate, Dioctyl sebacate, Ethyl phthalyl ethyl glocolate, 2-Ethylhexyl diphenyl phosphate, Glycerol, Glyceryl monooleate, Glyceryl triacetate, di-Isobutyl adipate, di-Isooctyl phthalate, mono-Isopropyl citrate, Propylene glycol, Sorbitol, Triethyl citrate, and mono-, di-, and Tristearyl citrate.

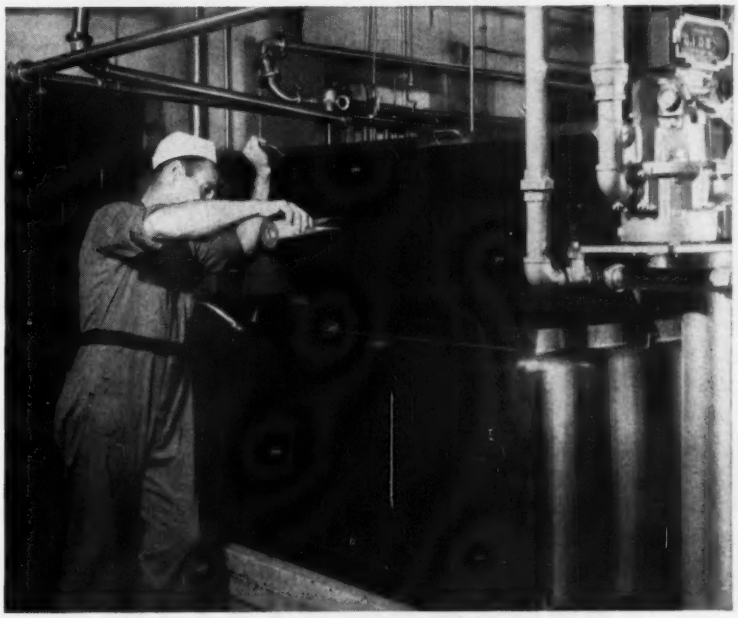
(ii) Epoxy type: Epoxidized soybean oil (iodine number less than 6; oxirane oxygen content 6% minimum), and 3(2-Xenoxyl)-1,2-epoxypropane.

(25) Release agents: Linoleic acid amide, Oleic acid amide, Palmitric acid amide, Petrolatum, Polyethylene glycol 400, 1,500, and 4,000, Polyethylene wax,

(*Continued on page 127*)

SILICONE NEWS from Dow Corning

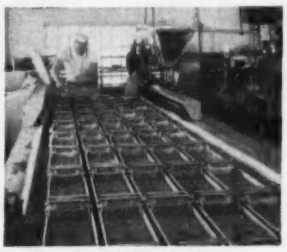
Prevent Costly Foam



Dow Corning Silicone Defoamers Reduce Waste, Increase Capacity

Foam is costly . . . it takes up production space, slows down processing, causes maintenance problems—may even create a fire hazard! You can control foam once and for all with the most effective antifoams ever developed: Dow Corning silicone defoamers.

Odorless, tasteless, and physiologically harmless, Dow Corning silicone defoamers are used extensively in processing and packaging foods, syrups, and antibiotics. Effective at extremely low concentrations and safe to use, they neither alter nor contaminate the end product. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; water-dilutable Antifoam AF Emulsion may be used at concentrations to 34 ppm.



IN FREEZING MIXES

A typical application: in making Fudgsicles, foaming of milk, chocolate and other ingredients caused numerous rejects of frozen bars and also cut production space. Antifoam AF Emulsion added to the processing prevents foam . . . helps keep production up and costs down.

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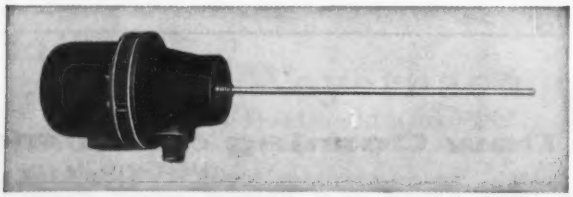
ROLLER TYPE SENSING ELEMENT is used to measure the moisture content of sheet materials. Segmented rollers are available for moisture profiles. When properly insulated, idler rollers on a machine can be used for measuring the average moisture content of sheet materials.



PROBE TYPE SENSING ELEMENT is used to measure the moisture content of granular materials.

THE HONEYWELL *MOIST-O-GRAPH* HAS BEEN TESTED AND PROVED WITH THESE MATERIALS:

POTATO SHEET
COTTONSEED
TOBACCO SHEET
FLOUR
OAT BITS
ALFALFA
OAT FLAKES
CASTOR BEAN
PEANUT MEAL
DRIED BEET BULB
BARLEY AND OATS GRASS
LIMA BEAN VINES
LINSEED MEAL
POTATO STARCH
PEARL STARCH

HONEYWELL *MOIST-O-GRAPH* measures moisture content from approximately 5% to 30% by resistance measurement, with a range of 0-100,000 megohms.

Automation makes any process pay extra dividends in productivity, product improvement and profit. One of the many ways Honeywell can bring you the advantages of automation is through precise, automatic control of moisture in granular and sheet materials.

The Honeywell *Moist-O-Graph* system gives you positive quality control, and lets you maintain a profitable moisture balance in your products. It gives you a continuous, permanent record of moisture content. It leads the way to tangible savings in your drying operations, and lets you use your manpower more productively. Presently installed *Moist-O-Graph* systems have paid for themselves in six months.

Let Honeywell survey your process for best possible application of the *Moist-O-Graph* system. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

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4. Analysis of exhaust gases.
5. Determination of viscosity of glass.
6. Test for specific gravity.
7. Electronic inspection.*
8. Visual inspection.
9. Polariscope evaluation.
10. Comparitor check of dimensions.
11. Dimensional check by gauges.
12. Weight check.
13. Capacity check.
14. Hydrostatic pressure tests.
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before Tygart Valley glass containers reach your filling lines.

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All the eye appeal of your product shows. And, Tygart Valley Quality Glass containers mean uninterrupted service on modern filling lines.

*Certain finishes and sizes

BROCKWAY GLASS
COMPANY, INC., Brockway, Pennsylvania
Sales Offices in Principal Cities
Subsidiary: Tygart Valley Glass Company, Washington, Pa.

←CIRCLE 83 ON READER SERVICE CARD

CIRCLE 84 ON READER SERVICE CARD

Irradiation Extends Storage Of Eviscerated Poultry

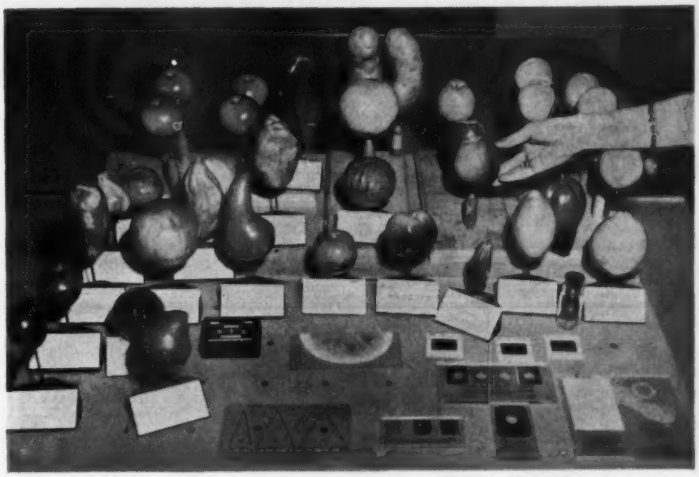
Whole eviscerated chickens from a mechanized plant were irradiated with gamma-rays from Co^{60} by packing (10 at a time) in a cylindrical container, and rotating slowly alongside radiation source.

Dosage rate was 50,000-100,000 rads/hr., and varying dosages up to one Mrad were given. Then carcasses were frozen at −2F. and compared with non-irradiated chickens, similarly frozen, for appearance, odor, and flavor.

Irradiated carcasses were more pink than the controls, apparently because of partial destruction of carotenoids in surface fat, and greater transparency of the muscle which intensifies its red color. Experienced observers could detect a slight odor in carcasses receiving over 0.125 Mrad, but it was not considered objectionable up to one Mrad. Consumer panel members did not comment on the odor.

The irradiated flavor was evident when fowl were cooked by steam, but not by roasting when the dose was below 0.5 Mrad. Up to one Mrad the flavor was detectable in roasted chickens. Delay in microbial spoilage was considerable—a dose of 0.8 Mrad permitted storage at 35F. for 50 days, compared to 10-12 days in control birds. However, there was a loss of quality after about 16 days and rejection rate by the consumer panel after 30 days was significant. Loss of quality during storage is greater for higher doses of radiation.

If a 3-fold increase in time is required with minimum loss of quality, a dose of 0.4-0.5 Mrad should suffice.—*J. Science Food & Agr.* 11(2), 61-71, 1960.



Visual Aids Improve Grading Accuracy

To insure uniform interpretation of grade standards for fruits and vegetables, Agr. Marketing technicians have developed visual aids that are used by Federal and Federal-State inspection services (photo).

Quickest to duplicate and cheapest to make are photographs and color slides. But color is hard to reproduce on film. So other techniques are used to establish color designations.

Red color of tomatoes, and blush of peaches are hand-painted on models or plastic color guides. Interior of watermelon is reproduced by a skilled artist on plastic sheets.

For other fruits and vegetables, models provide means of explaining standards of shape and texture. They present 3-dimensional views which show overall shape of products such as potatoes, pears and apples, and illustrate texture of citrus fruits.—*Agr. Marketing* (Wash. 25), 14-16, March, 1960.

Elastin Content of Sausage Indicates Meat Type Used

Connective tissue in meat or meat products can be estimated by comparing total nitrogen in products with N extracted by 0.05 normal alkali in 24 hr. at room temperature.

When method is applied to meats from different grades of animals connective tissue N as % of total nitrogen is lower in better grade animals. Young and undernourished ones always have higher CTN contents.

Further subdivision, into collagen and elastin N, may be made by boiling connective tissue fraction with water and tartaric acid to dissolve collagen. This determination shows that pork tissue contains less elastin than beef, while certain tissues of young animals contain more elastin than the same tissues of older animals. By examining meat products in this way an idea of the type of meats used in their production can be gained.—*J. Sc. Food & Agr.* 10(9), 468-72, 1959.

Housing of Laying Hens Reduces Egg Yolk Color

Eggs from hens of the same parent stock, but grown on the ground with a free range, had a deeper yolk color than eggs from those housed in laying batteries.

Eggs from battery hens were slightly heavier, the extra weight being due to more white and shell. They had a slightly lower quality rating by the Haugh test, slightly lower total solids in the liquid whole egg, and very slightly lowered viscosity.

In functional tests, however, they appeared to give slightly better results, aeration of sponges was better as was fruit-holding ability in fruit cakes. There was no difference in quality of egg whites, nor in flavor and aroma of sponges and cakes made with the two types of eggs.—*J. Science Food & Agr.* 11(2), 115-21, 1960.

Detecting Fungal Amylases

Since their activity is essentially the same as that of the cereal alpha- and beta amylases, fungal amylases are not detected in ordinary exami-

• Many plant operating people responsible for specifying conveying systems today are demanding equipment that is right *for them*—that will fully meet *their* individual requirements. They are looking beyond the price—to design and quality.

Mathews Engineers are giving these people a complete conveyer service—from the first proposal through installation—and equipment that is delivering outstanding performance.

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Over Fifty Years of Leadership in Mechanized Handling

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86 CIRCLE 86 ON READER SERVICE CARD

nations of flour. They are, however, more sensitive to heat than the cereal ones, and can be destroyed by heating flour-water suspensions before measuring amylase activity.

In practice, a sample of flour is extracted with 0.2% calcium acetate, and 0.1% NaCl solutions at 87F., following which an aliquot of the extract is heated to 155F. for exactly 30 min. Alpha-amylase activity of both heated and unheated extracts is determined by the method of Jongh. Activities due to fungal and cereal amylases are calculated from simple formulas which assume that the former is 83% destroyed by heat, and latter about 10%.—*J. Sc. Food & Agr.*, 11 (1), 54-60.

Prepackaging Treatments Help Fruit Keep Longer

Dipping fruits in chemical solutions before packaging shows promise of extending their shelf lives considerably.

In experiments at Utah State U. firm ripe strawberries and Bing cherries were dipped in solutions of various chemicals, air dried, put in sterile plastic baskets, which were placed in poly bags and stored at 41F. Strawberries were kept 1 month, cherries 1½ months.

With strawberries, Captan (Calif. Spray Chem. Corp.), DHA-S and Dowcide A (Dow Chemical Co.), all at concentrations of 1,000 ppm., showed significant fungicidal effects and, also, maintained color. Potassium sorbate (1,000 ppm.), DHA-S, Dowcide-A (1,000 ppm.), and Myprozine (100 ppm., Amer. Cyanamid) retarded mold growth in cherries.—*Farm & Home Science* (Utah Agr. Expt. Sta., Logan), 18-19, March, 1960.

Enzymes Play Big Role In Cocoa Fermentation

During cacao fermentations enzymes produce changes in the pulp and cotyledon that develop chocolate flavor in beans, until the rising temperature of fermentation inactivates them.

By 92-96 hr. after fermentation started inactivation was essentially completed on 6 enzymes studied during fermentation of heaps up to 2,000 lb. of Amelonado (West Africa) beans.

Inactivation is most rapid at tops of heaps where temperature is high. There appears to be little point in

CIRCLE 87 ON READER SERVICE CARD→

IMITATION RASPBERRY BY FIRMENICH

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it with all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to give them greater sales appeal. Samples and technical data on request.

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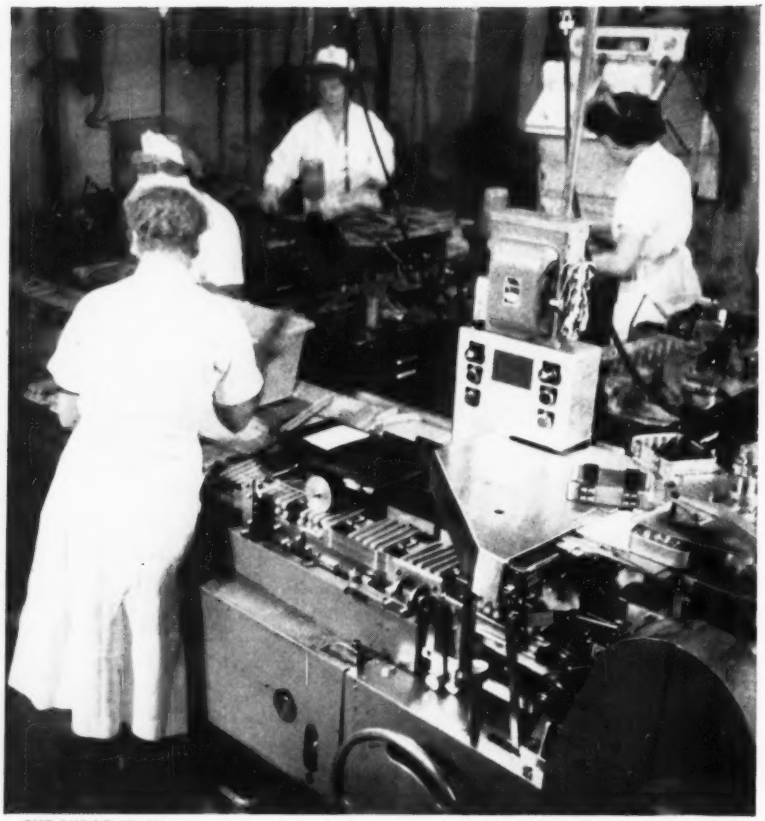
LOS ANGELES, 1756 MALCOLM AVENUE
GENEVA PARIS LONDON

WRAP-KING doubles frank production for John Krauss Company

Gain achieved with no increase in personnel

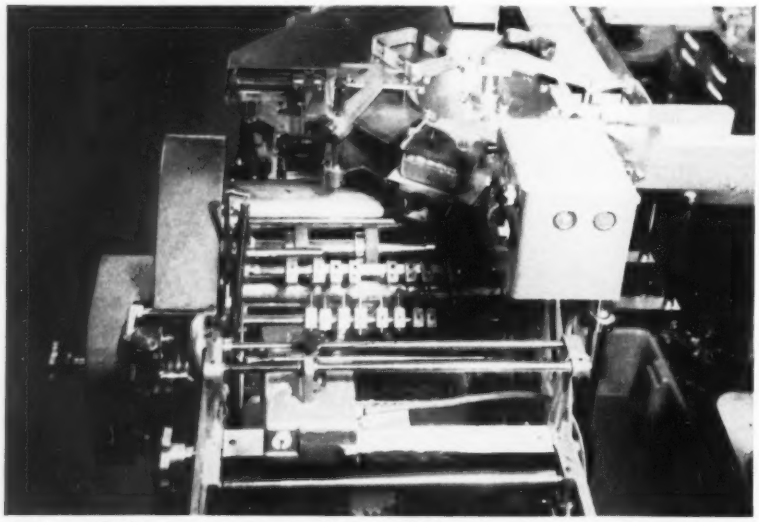


CKF WRAP-KING wraps 1 lb. of franks 5 over 5 on a card without collar. Machine can also wrap ½ lb. of franks, 5 in a single row. Production rate is up to 60 packs per minute.

"The 100% increase in our production made possible by C & K's high-speed, automatic frankfurter wrapping machine is only the beginning," says John Krauss, President of the Long Island meat packing firm. "In the next few months, we expect to make improvements in our line that will enable our C & K equipment to operate at even higher speed, resulting in further savings.

"Since the CKF is the only machine engineered specifically for completely automatic frankfurter wrapping, it was the logical choice for increasing our production. Workers simply place the franks on a card. The CKF wraps, seals and delivers them at a greater speed than ever before. Maintenance costs have been reduced, too. We have experienced virtually no down time with the CKF."

Outstanding performance like this has made C & K automatic wrapping and can packing machinery the first choice of an increasing number of plants throughout the country. Whether your problem is wrapping standard or unusual shapes . . . or greater efficiency in packing cans, it will benefit you to check the complete and versatile line of high-speed, automatic C & K machinery. For full details including leasing plans, write Crompton & Knowles Packaging Corporation, Holyoke, Massachusetts.



Feeding mechanism handles all commercially available films. Electric eye registration allows use of printed films. Optional equipment includes card feed, card ejector and code dating unit.

CROMPTON & KNOWLES C&K PACKAGING CORPORATION

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National Sales and Service Offices: NEW YORK • CHICAGO • LOS ANGELES • ATLANTA • DALLAS • CLEVELAND • BERKELEY, CALIF. • SEATTLE • OGDEN, UTAH • WINTERHAVEN, FLA. • TORONTO • MONTREAL

prolonging microbial fermentation after the beans are dead, lest off-flavors develop and the chocolate flavor diminish.—*J. Sc. Food & Agr.*, 10(12), 691-700, 1959.

Antibiotics Improve Quality Of Ice-Stored Herring

Fresh herring, frozen alive in solid CO_2, contained about 10 mg. acetic acid, 1 mg. formic acid, and 0.4 mg. propionic acid, along with a trace of n-butyric acid per 100 g. of flesh, identified by both gas and paper chromatography of an alcohol extract.

Post mortem, all acids increased during storage at 50-55F., rapidly after 36 hrs. Isovaleric acid appeared after 72 hr., but amount was not more than 0.1 mg./100 g. in oldest sample.

When Scottish summer herring were preserved in ice, with and without 5 ppm. oxytetracycline or chlortetracycline, antibiotics did not affect production of volatile acids. Organoleptic qualities were improved markedly by presence of antibiotics, suggesting that volatile acid values are an indication of post mortem age of fish, rather than condition. Cooking in 14-oz. lacquered oval cans for periods up to 5 hr. at 240F. had no important effect on volatile acid content.—*J. Science Food & Agr.*, 11(1), 47-53, 1960.

Yeast-Inhibiting Antibiotics Aid Contamination Studies

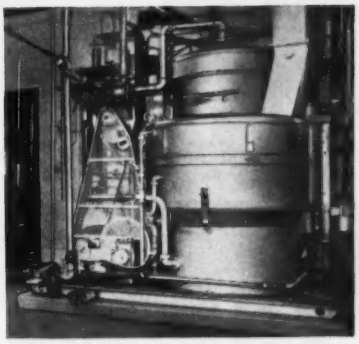
An antibiotic-containing medium that inhibits yeast but does not interfere with bacterial growth is useful for estimating bacterial contaminants in food and bakers' yeast. Actidione at 4 ppm. inhibits brewers' yeast and, at other concentrations up to 500 ppm. inhibits many, but not all, species of yeasts.

In a survey made with 5 species of yeast, 5 species of bacteria, and 9 antibiotics it was found that candicidin, filipin, fungichromin, nystatin, and rimocidin were suitable for incorporation in a medium to suppress growth of yeasts.

When used in a tryptophan-Yeastrel-glucose agar medium, satisfactory counts of bacteria contaminating food yeasts were obtained. Concentrations of 5 ppm were adequate for 4 of the 5 antibiotics; nystatin requires 15 ppm.—*J. Sc. Food & Agr.*, 10(12), 651-56, 1959.

3 BOILERS IN 1 COMPACT PACKAGE!

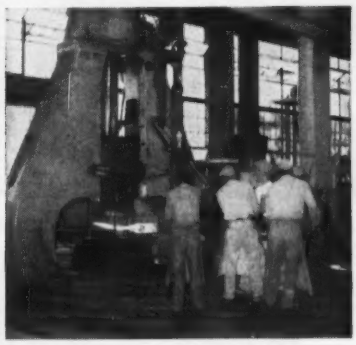
FOR ORDINARY STEAM REQUIREMENTS: The cycle-type Modulātic standard unit furnishes 90% dry steam for most ordinary needs such as cooking, heating water, drying, cleaning, etc.



WHERE DRY STEAM IS REQUIRED: The Modulātic may be used with an optional steam separator, for over 99% dry steam for heating, moulding, forges, operation of power equipment, etc.

VAPOR MODULĀTIC WATER TUBE BOILERS

¼ the size and weight of conventional boilers... largest size (150 BHP) uses only 5′ x 8′ space.



IF CONSTANT STEAM LOAD MUST BE MAINTAINED: For applications where even a nominal drop in pressure cannot be allowed, an optional steam reservoir may be added to the standard unit to provide a "cushion" during an off cycle.

Efficient . . . economical . . . proved in thousands of installations all over the world! Vapor Modulātics furnish high or low-pressure steam (at design pressures up to 1000 psi, or even higher). Lowest installation costs—delivered completely assembled, wired and tested . . . all sizes (40 to 150 BHP) fit through plant doors, with no special foundations or special chimneys needed. Simple push-button operation; built-in safety controls. May be mounted in multiple units to provide for the largest steam requirements—without the inefficiency of idling larger single boilers as demand slackens.

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Our requirements are:

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SAFETY VALVE SETTING_____
MINIMUM STEAM LOAD_____
MAX. STEAM LOAD_____
STEAM PRESSURE_____
TYPE OF FUEL_____

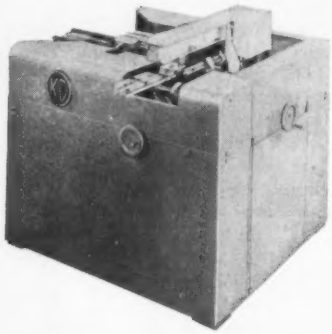
CIRCLE 89 ON READER SERVICE CARD

22 Machines for Better Packaging

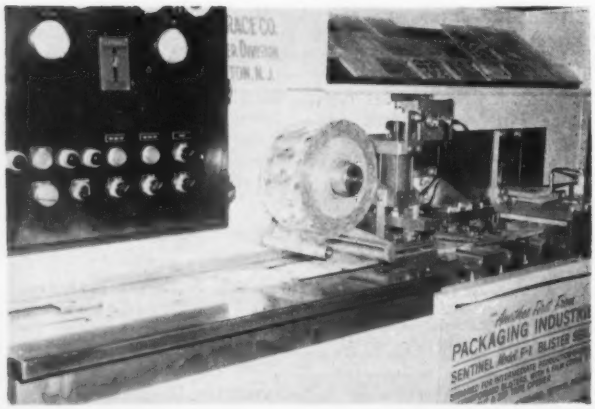
Fillers, sealers, packers, checkweighers, coders, labelers spotlight AMA show

6 Packers, Sealers, Cappers

AUTOMATIC PACKER for pies, prepared dinners, etc., handles up to 300/min. Features random product infeed that eliminates manual indexing, special plows that edgelock new Maralock cartons.—*Marathon Div., American Can Co., N.Y.C.* (323)

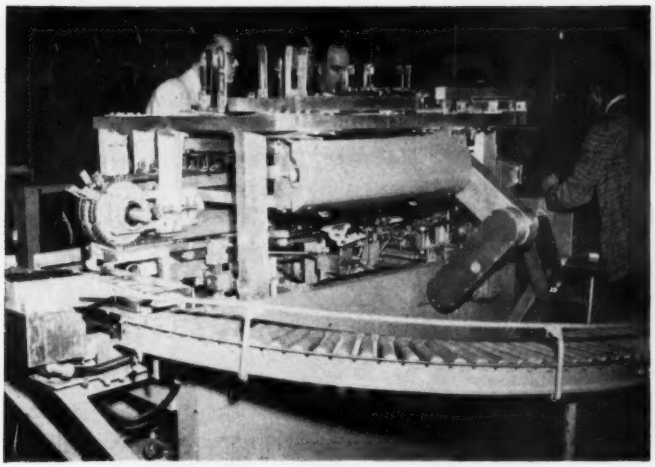


TRANSPARENT LID machine handles 5-10 mil acetate and polystyrene covers in sizes from 3x2x½ to 14x9x2½ in. at 30/min. Lids are creased and heat sealed without prior scoring or bonding. Edge is beaded for rigidity.—*FMC Packaging Mch'y. Div., Philadelphia.* (324)



BLISTER SEALER applies film cover to preformed, filled plastic packages (2x2 to 6x8 in.) at 600-800/hr. Unit automatically indexes tray under web fed from overhead roll, then heat seals film to body, die cuts edges leaving 3/16-in. flange.—*Packaging Industries, Montclair, N.J.* (325)

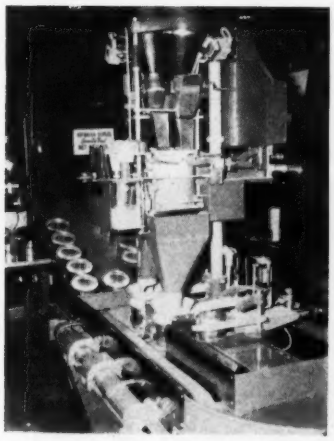
ROLL-ON-CAPPER for round plastic or combination paper and plastic cups mounts on automatic filler (Anderson), operates at filler speed. Applies either paper or plastic covers with rolling action as filled container moves along conveyor. — *Lily-Tulip Corp., N.Y.C.* (326)



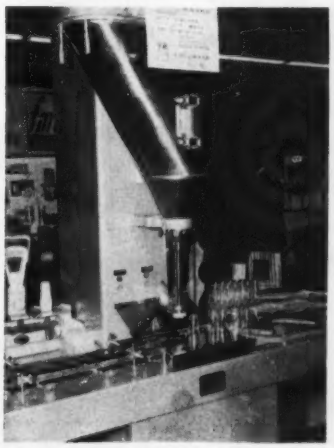
CLUSTER WRAP SYSTEM for multi-packaging square or rectangular products in sizes to 8x3/4x10, operates at 150/min. Uses printed cartons with self-locking tabs.—*Mead Packaging Div., Mead Corp., Atlanta, Ga.* (327)

POLYSTYRENE SEALING machine uses high pressure, low heat to fasten cover on container. Seal withstands high and low temperatures.—*G. T. Schjeldahl Co., Northfield, Minn.* (328)

3 Fillers, 1 Checkweigher

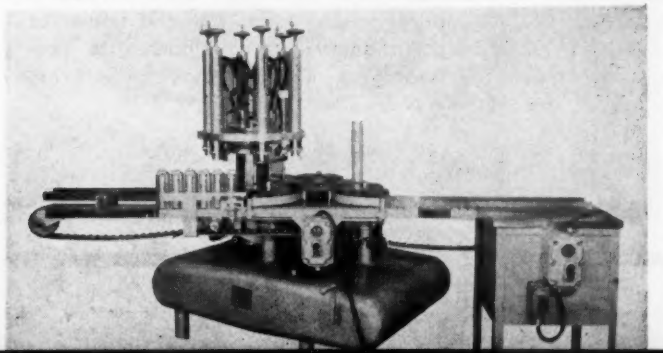


WEIGH FILLER for cans of coffee and other granular, crystalline or powdered products features high accuracy (±1/64 oz. on ½- and 1-lb. weights) and vibrating settling without spillage. Available in 8 sizes with speeds from 20-200cpm. Interlocking controls: (1) Prevent weigh hopper from discharging when no can is in filling position, and (2) do not permit short- of unfilled cans to move to closing machine.—*B. F. Gump Co., Chicago.* (329)



UNIVERSAL UNIT for dry products automatically fills cans, jars, cartons, bottles and boxes at up to 50/min. Special serpantine conveyor smoothly feeds odd-shaped containers (1x1x½ to 4½x4½x8 in.). Employs three filling methods to assure filling accuracy: (1) Adjustable cam volumetric; (2) volumetric packing, and (3) vacuum volumetric. —*FMC Packaging Mch'y. Div., Philadelphia.* (331)

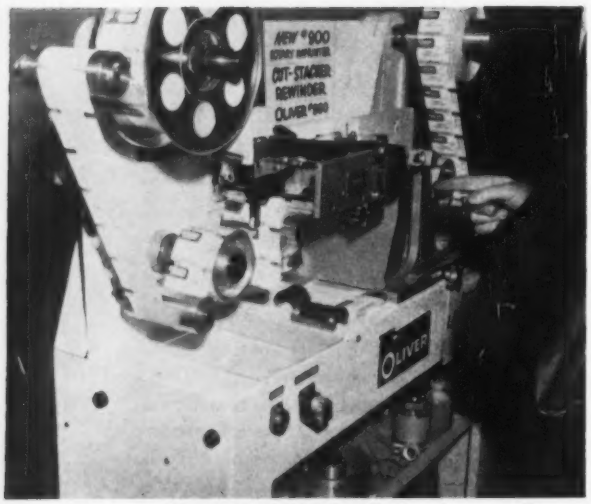
ROTARY PRESSURE FILLER for aerosols has vacuum crimper to prevent closing of can when valve doesn't seat properly . . . 100cpm, unit also available with automatic tip applicator.—*Kartridge Pak Co., Franklin Park, Ill.* (330)



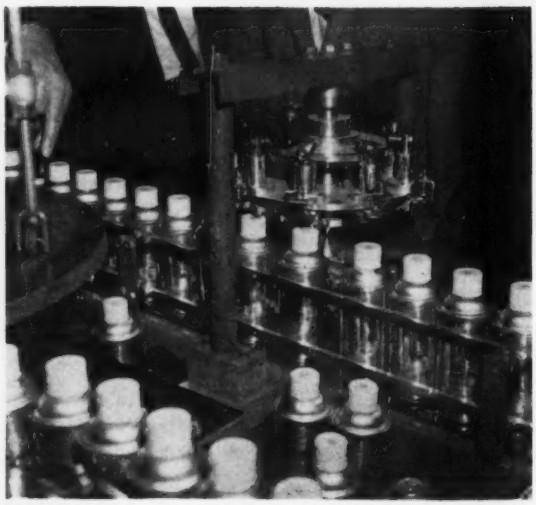
22 Machines for Better Packaging *(Continued)*

CHECKWEIGHER for small packages (to 4½x6 in., weights 4-50 oz.) has 3 classification zones, reject take-away to divert off-weight units. Has zone-edge tolerance of ±1/32 oz. Speed to 50/min. — *Toledo Scale, Toledo, Ohio.* (332)

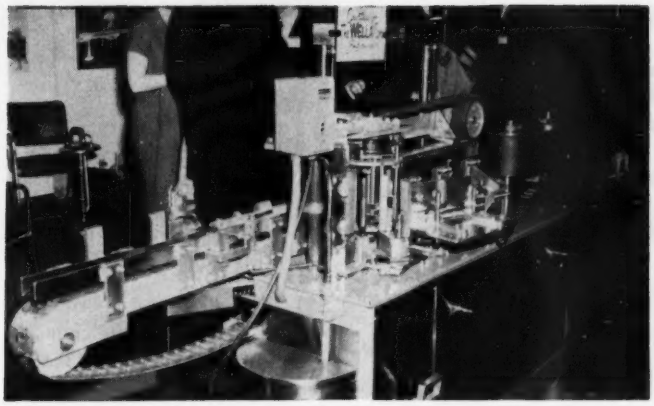
3 Coders, Labelers



IMPRINTER-REWINDER prints roll-type labels, winds them back for use on automatic machinery. Uses constant ink supply pot and rotary feed print segment that simultaneously carries rubber logo and drives labels.—*Oliver Mch'y. Co., Grand Rapids, Mich.* (333)

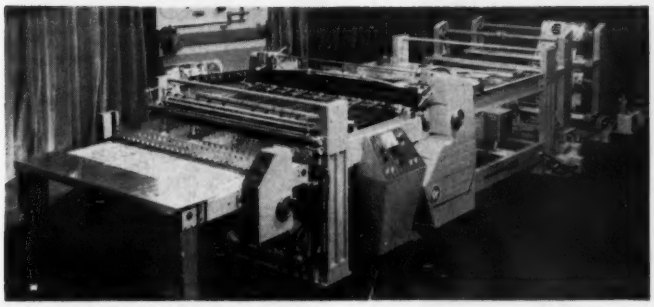


CODER imprints tops of cans, jars and bottles at 1,000/min. Friction-driven unit attaches to conveyor or packaging machine.—*Adolph Gottscho, Inc., Hillside, N.J.* (334)



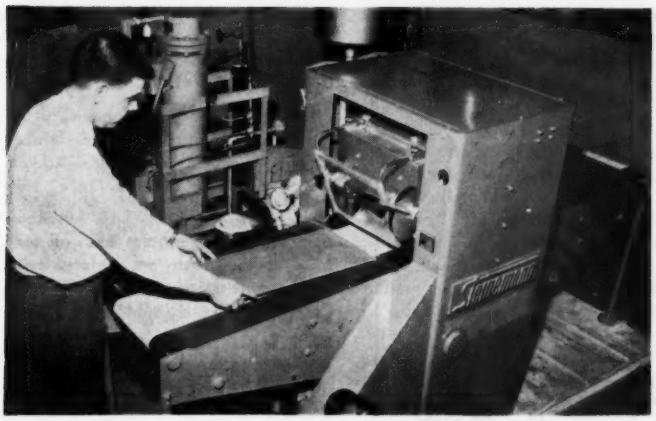
STRAIGHT-LINE LABELER applies sizes from postage stamps to 6x7 in. to round, rectangular, oval or square containers at 40-150/min. Handles foil, paper and other labels, glass, metal or plastic containers.—*MRM Co., Inc., Brooklyn, N.Y. (335)*

4 Miscellaneous Units



TWIN BAG MACHINE makes sealed containers up to 55 in. wide from printed rolls of poly, or 2 bags side-by-side from separate 27-in. webs at 560/min.—*G. T. Schjeldahl Co., Northfield, Minn.* (336)

CURTAIN COATER applies melted poly to cut sheets of paper or board. Stock is conveyed at high speed through uniform curtain produced by forcing melted plastic through finely machined, adjustable slot.—*Displayed by Eastman Chemical Products, N.Y.C. (337)*



PROBLEM:

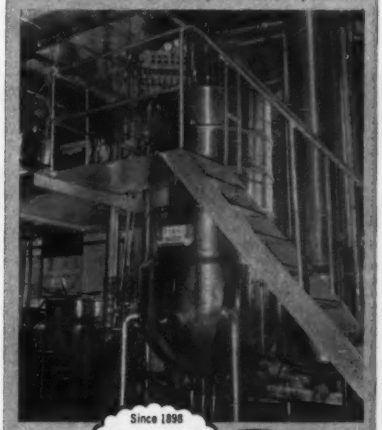
Produce Quality Spreads More Efficiently; Reduce Costs

SOLUTION:

Mojonnier

VACUUM FRUIT SPREAD COOKER

Mojonnier 48" Vacuum Spread Cooker in plant of M. Polaner & Son, Newark, N.J. plant. Production line push-button operated.



Since 1898 Polaner and Son producers of the finest jams, jellies, preserves

The Mojonnier Fruit Spread Cooker brought these advantages to Polaner:

▶ IMPROVED FLAVOR—Since the product boils at 134°F, carmelization and burned tastes are eliminated. Gentle cooking treatment improves natural fruit appearance. Essence is recovered in condensate.

▶ UNIFORM COOKING—Steam heated inner jacket is designed for maximum heat transfer. Cooking under vacuum assures natural fruit color and flavor retention—permits faster sugar penetration.

▶ GREATER EFFICIENCY—Vacuum cooking is faster—push-button controls fill, empty or transfer product, using air valves. Solid stainless steel sanitary construction plus "in-place" cleaning guards against off-flavors. One 42" Cooker equals production of four, 100-gallon open kettles.

If higher production costs have cut your profits, check the low cost efficiency of the Mojonnier Fruit Spread Cooker.

Write: MOJONNIER BROS. CO.
4601 W. Ohio St., Chicago 44, Illinois

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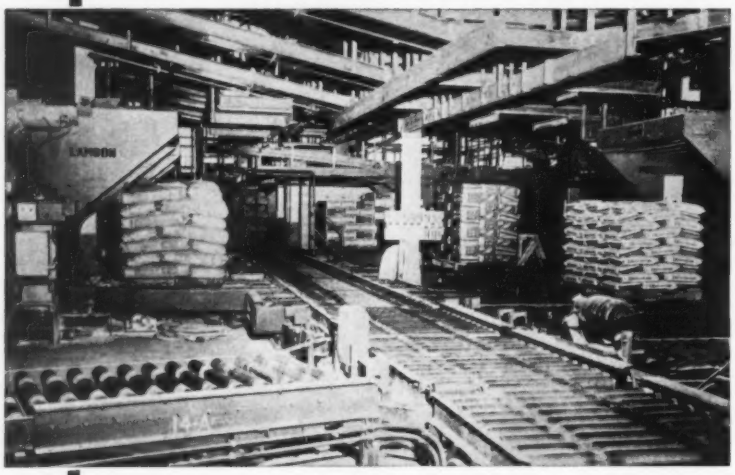
QUALITY ENGINEERED FOR ECONOMY

VACUUM FRUIT SPREAD COOKERS

Dependable Products . . . Backed by Dependable Service

MECHANIZE... PROFIT-WISE!

WITH LAMSON ENGINEERED CONVEYOR SYSTEMS



Automatic Palletization — the hub of a LAMSON engineered conveyor system linking production lines to warehouse.

You cut production time and the unnecessary handling of materials to the bone with the help of LAMSON engineers. They are specialists in developing materials handling systems that truly increase the capacity of your present buildings and dramatically increase the productivity of your present equipment.

There are more LAMSON custom engineered conveyor systems in successful operation today than any other kind. They are being serviced throughout their life by the same LAMSON field offices that initially analyzed the problem, proposed the solution and supervised the installation.

As a result of this complete, professional service you will find many of the finest names in industry among LAMSON installations. During the past 75 years LAMSON has been active in almost every field, yours included, and perhaps even in divisions of your own firm. LAMSON can cut costs; speed production; increase your profits.

If you have a materials handling problem, write LAMSON today for our conveyor catalog and the name of your nearest LAMSON Field Engineer. Or, simply clip this advertisement to your letterhead and mail to:

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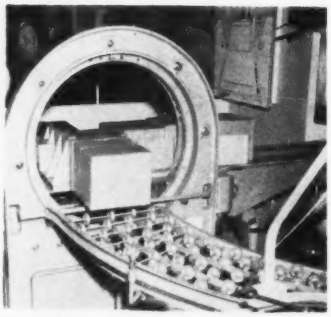
Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

SET-UP UNIT for 6-16 oz. carriers at 40/min. can be changed over without tools in less than 2 min. Portable, 2-ft. square machine is either automatic or operates "on demand." — *The Gardner Div., Diamond National Corp., Middletown, Ohio. (338)*



ROUND STEEL STRAPPER automatically tensions, ties and cuts light gage material, then ejects package, positions next one.— *U. S. Steel Supply Div., Chicago. (339)*

5 More Topflight Units

QUAD STAYER produces thermoplastic boxes in sizes from 3x13/8x½ to 23x15 5/8x4½ in. at 60/min.—*FMC Pkg. Mch'y. Div., Philadelphia. (340)*

VERTICAL CARTONER (Bivans) is semi-automatic, forms and tucks bottoms at up to 120/min., transfers cartons to filling unit.—*New Jersey Mch. Corp., Hoboken, N.J. (341)*

PRINTER for applying high-quality imprints, such as prices, on side surfaces of cartons, cases, cans, etc.—*Adolph Gottscho, Inc. Hillside, N.J. (342)*

ROLL FEED ATTACHMENT for company's labelers enables use of roll-form units. Labels are automatically verified and coded.—*New Jersey Mch., Corp., Hoboken, N.J. (343)*

CASE SEALER-TAPER enables fastening with glue, tape, or both at packing line speeds.—*Emhart Mfg. Co., Portland, Conn. (344)*

NEWEST TOOL for sparking impulse sales is polypropylene film, just OK'd for food use. Olefin has clarity and high gloss of cellophane, plus longer shelf-life protection. Heat sealable, it handles well on most automatic units without major machine modifications.

Miracle Film Gets Food OK

Long-awaited debut of low-cost, useful polypropylene for food packaging nears as FDA gives green light

AVAILABILITY of a low price, versatile film that combines some of the best virtues of cellophane and polyethylene (and eliminates some of their vexing drawbacks) was cleared for food industry use last month. Signal for the go-ahead was FDA's clearance of Hercules Powder's polypropylene for food packaging use. Later, AviSun won similar approval for its film.

Ever since it emerged from the labs 3 yr. ago, this newest (and, in many ways, most interesting) polyolefin has caught the fancy of food firms. That's because film has these important characteristics:

▶ **Package appeal.** It has the impulse-selling clarity and sparkle of cellophane, even for six to eight thicknesses. Unlike cellophane, though, it doesn't dry out over long storage periods and isn't as adversely affected by temperature and humidity changes. Also, its heat seal is readily peelable—an advantage that's sure to rate well with housewives who complain about the difficulty of opening polyethylene packages.

▶ **Machinability.** Stiffer than polyethylene, it reportedly requires less tricky handling on automatic overwrappers. Kordite Co., latest entrant in the polypropylene sweepstakes, says its film is the first thermoplastic olefin capable of operating on most automatic units without need for major machine modifications, and that it can be used on any cellophane equipment for overwrapping or bag-forming.

▶ **Barrier protection.** Offering twice the moisture protection of cellophane, the film is resistant to grease, oil, common acids, chemicals and solvents—thus enhancing its use as a liner or pouch. Also, it keeps aroma in, odors out.

▶ **Impressive yield.** Compared to cellophane's yield of 20,000 sq. in. per lb., Kordite claims its oriented olefin in ½-mil gage gives 50,000 sq. in. per lb. AviSun reports that its unoriented film (1-mil) provides the user with 30,000 to 31,300 sq. in. per lb.

▶ **Low Cost.** Because of its high yield, polypropylene is competitively priced with other film favorites—and Kordite expects the olefin to even compete with paper eventually. Kordite's ½-mil version is tagged at 3.5¢ per 1,000 sq. in., and AviSun's 1-mil entry at 2.6¢. Compared to this, 1-mil polyethylene costs 2.7 to 3.0¢; cellophane, 2.7 to 3.3¢; Saran, 4¢; and Videne, 4.36¢.

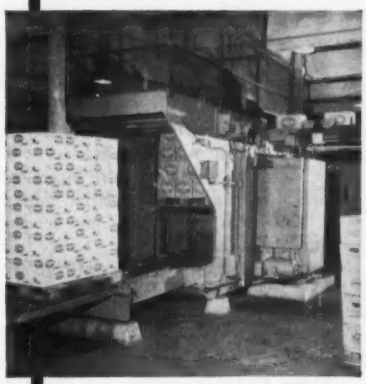
Some insiders see polypropylene cutting a wide swath in the boil-bag field. E. W. Cronin, of Hercules, tells FE that "the higher temperature characteristics of the film would allow for autoclaving or boiling without deleterious effect such as shrinking."

Special molded containers are another outlet, although lower-priced polystyrene would provide a formidable challenge.

As with any new film, some knotty problems remain. It's said that the film tends to age under strong lighting conditions, and that layers of roll film may stick together. However, makers say these headaches are being ironed out—plasticizers lick the ageing bottleneck, Hercules contends. —*FE Staff*

MECHANIZE... PROFIT-WISE!

WITH A LAMSON AUTOMATIC PALLET LOADER



Gauged to handle any flow

Designed logically to receive the stepped-up mechanized flow of packaged goods from high speed production lines, the LAMSON AUTOMATIC PALLET LOADER provides the perfect link between packaging and warehousing.

Fast, accurate and dependable, the LAMSON AUTOMATIC PALLET LOADER performs a complex and variable operation for long periods of time with minimum maintenance.

Initial cost may be amortized out of savings the LAMSON AUTOMATIC PALLET LOADER effects in reducing man hours per pallet load and damage or breakage to packages.

Write for THE AUTOMATIC PALLET LOADER catalog. It may well be the answer to your particular materials handling problem. Or, simply clip this advertisement to your letterhead and mail to:

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LAMSON CORPORATION

507 Lamson Street, Syracuse 1, N. Y.

PLANTS IN SYRACUSE AND SAN FRANCISCO
OFFICES IN ALL PRINCIPAL CITIES

Spadework Wins Buyer OK for

Shrewd market-consumer tests by Sunkist counter chains' "show me" attitude on new items. This gets $1.7-million fruit-punch merchandising drive off to firmer start

MAKING YOUR ENTRY stand out among 120-or-so new items presented to chain store buying committees each week calls for strong proof of consumer acceptance.

What it takes to win buyer approval in today's competitive market is shown by the year-long seeding Sunkist carried out prior to its just-announced campaign to put four frozen lemon-based fruit drinks into national distribution.

To grab a foothold in the fast-growing juice-blend market, the West Coast cooperative will bankroll a $1.7-million merchandising drive this year. And the size of Sunkist's bet—more than it spent on TV, magazines, and Sunday supplements in '59—indicates the high stakes the blends represent today.

Figures on the market's size are hard to come by. But here are three weather vanes that show where consumer fancy is turning:

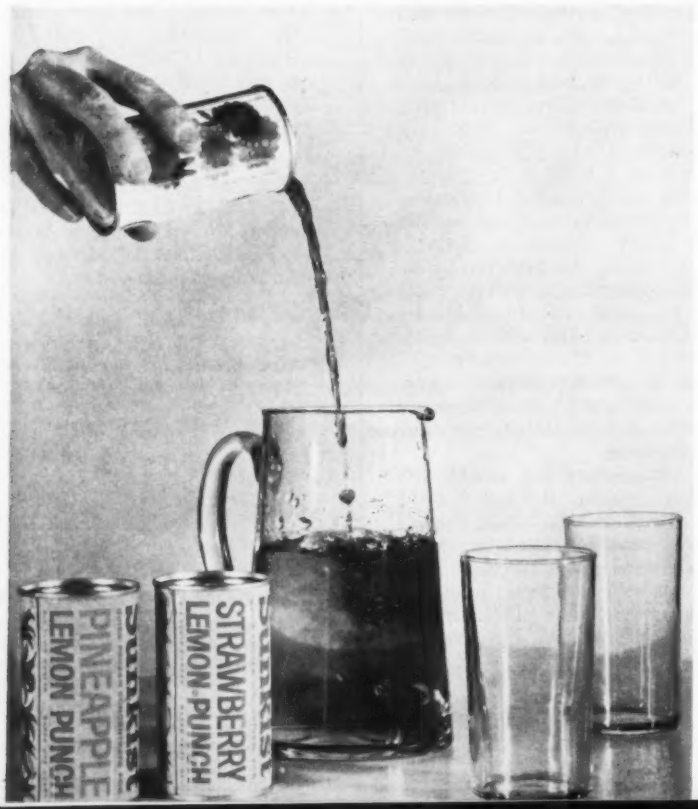
▶ Pacific Hawaiian Products, whose canned punches are said to be No. 1 in their field, more than doubled sales between '56 and '59—rocketing from $7.4 million to $17.7 million.

▶ Consumer purchases of one of the more popular blends, pineapple-grapefruit, are booming along—up from 6.0 million cases (24/2) in the '56-'57 season to 12.9 million in '58-'59, according to USDA data.

▶ Dole's canned and frozen pineapple blends (orange & grapefruit), out only 2 yr., already account for 12% of the firm's $91 million volume, Pres. H. C. Cornuelle reveals.

C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

FILL NATION'S PUNCHBOWL—that's the aim of Sunkist's new $1.7-million drive to expand distribution of four frozen fruit drinks on a national basis. Campaign is largest single-product effort in co-op's 67-yr. history, was preceded by intensive 2-yr. study of market and consumers.



More Blood-Letting, Too

Naturally, this kind of spectacular growth always breeds stiffer competition—and the blends have been no exception.

Pacific Hawaiian, probably the biggest roadblock Sunkist will face in trying to build a broader franchise for its punches, has had to put more brawn into its marketing budget each year to stay up front. In the '56-'59 period, for example, while the firm's sales rose 237%, selling expenses shot up at a discouragingly faster rate —317%, in fact.

Behind this uptrend has been the strong bid by several other firms (including such well known names as Libby, Stokely, and Calpak) to get shelf space for their new blends. What this adds up to is suggested by Pacific Hawaiian's latest annual report, which shows $299,964 given out as cash discounts—some 215% more than in '56. This outlay probably accounts for the stress Sunkist is putting on handsome ad allowances in its trade promotion.

Despite the entrenched competition, Sunkist is still confident that the punches will be the philosopher's stone the co-op has long been looking for—a year-round best-seller for processed lemons. As Marketing Director D. M. Anderson sees it, the four fruit drinks have these factors in their favor:

. . . **Only products of their kind with a pure base**—no synthetic colors or flavors are added. And, he contends, preliminary probing showed this to be a significant persuader with consumers.

. . . **Create their own market at the expense of bottled and canned soft drinks,** rather than take sales from fresh lemons and frozen lemonade, according to market research findings.

. . . **Successfully penetrated the private label barrier,** establishing a beachhead in supermarkets where previously the chains' own brands excluded Sunkist's lemonade.

If the co-op is convinced it has a

New Product

new winner in the mass beverage market, it's because of the revealing information turned up by intensive market and consumer studies made in selected areas during the past 2 yr. For one thing, the tests showed that the fresh-fruit beverages had potentially broad acceptance – heavy purchasers included younger families with children, and people with higher educations, above average incomes.

Sales Beat Estimates

In '58, the first year of packing the three original punches (strawberry-, raspberry-, and pineapple-lemon), sales tests were carried out in Ft. Wayne, Muncie, and Evansville, Ind., and Danville, Ill. Later, product sales department targeted the expected '59 volume at 250,000 cases.

However, the company got a quick clue to the products' mass market potential when sales topped 296,000 cases by Oct. 31, 1959—a whopping 20% over original estimates. And, as a further dividend, test marketing of a fourth blend (grape-lemon) in New England and Canada snowballed the grand total to 392,000 cases.

While this unusually strong acceptance pointed toward a major market, Sunkist and its ad agency cautiously began other studies to rule out the possibility that this success derived from short-lived consumer enthusiasm for the new beverages.

Sales of the punches were compared to the performance of several other competitive beverages. These showed significant trends.

As one example: Frozen lemonade sales peaked during the summer, then dropped sharply to 10% of their warm-weather level during the winter. Also: Sales of colas and ades crested in the summer, but retained about 30% of this volume during the cold weather months.

Since the punches are more closely related to ades and other beverages, Sunkist reasoned that they should approximate 30% of their summer volume in the winter. In fact, the co-op hopes to sell 1.5 million cases in fiscal 1960.

To check this out, the co-op launched an extensive consumer research study in the New York City marketing area. About 700,000 families, it was learned, tried the punches at least once in the May 15-Oct. 15 period last year. And about 25% (roughly 165,000 families) bought the punches (any flavor) three or more times.

Especially encouraging was the fact that families that bought punches most frequently tended to reduce their purchases of canned juices (other than lemonade). There was substantial evidence that the frozen drinks were replacing canned juices, and not other punches, ades, or lemonade.

Goes National in '60

Basic theme of the national marketing program was developed on a smaller scale in the New York campaign. Results there were so impressive that between May and Oct. store saturation jumped from 8% of all outlets to 57%. And, on Dec. 24 —during the period in which freezer space is normally occupied by Christmas items—it reached the higher level of 68%.

A substantial chunk of Sunkist's $1.7 million merchandising budget will go for a strong advertising barrage to build up consumer demand. Several full-page ads in *Life* magazine this spring and summer will be backed by local campaigns in many individual markets.

Large-scale local ad drives are scheduled for New York City, Chicago, Philadelphia, and Los Angeles. Other major cities will be bombarded by radio, TV, and daily newspaper ads.

To top this off, two 10¢ coupon offerings are set for the top 60 markets. These will be timed with the high beverage consuming weekends, such as Memorial Day and July 4th.

Sunkist hopes to pay for the bulk of this investment through sales of the punches, and, accordingly, has built "an adequate profit margin" into the price structure. At first, though funds will be drawn from the co-op's lemon products pool to support the introduction program.

Sensing the David vs. Goliath battle that's shaping as a result of Sunkist's plans, Pacific Hawaiian has taken several steps to strengthen its own position. Last Fall, it (1) bought Hawaiian Fruit Growers Exchange to assure a stable supply source, (2) opened a refrigerated warehouse in Fullerton to avoid extra storage and handling charges involved with use of public facilities, and (3) took the plunge into national magazine advertising as part of a record ad budget.

Lacking the capital for mammoth ad blasts, Pacific Hawaiian has relied on a strong broker network and hard-hitting point-of-sale displays. To counter this, Sunkist will field a special force of high-level missionary men who will serve as direct contacts with chain store execs, informing them of the co-op's merchandising programs for the punches and other new products to come. —*End*

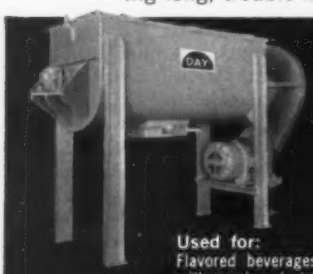
Four new frozen fruit punches by Sunkist!
New! From fresh ripe fruit. Sunkist squeezes the flavor and color of good fresh fruit into these new punches. You get real vitamin C, too.
No artificial flavor - no artificial color. Sunkist Punch makes fun of your thirst! One 6-oz. can makes a quart. At your grocer's freezer now.
Sunkist RASPBERRY LEMON PUNCH
Sunkist GRAPE LEMON PUNCH
Sunkist PINEAPPLE LEMON PUNCH
Sunkist STRAWBERRY LEMON PUNCH

CONSUMER promotion emphasizes no artificial flavors or colors have been added to frozen punches. Shown is 2-page spread timed for Memorial Day.

3 good reasons

why leading food processors select DAY equipment

1. for top operating efficiency; highest quality of product, lowest production costs
2. for sanitary construction and ease of clean-up between batches
3. for excellence of design and manufacture—providing long, trouble-free service; minimum maintenance



DAY RIBBON BLENDERS and MIXERS

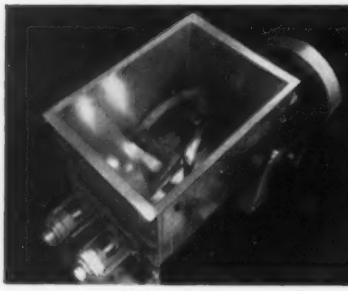
give fast, efficient blending and mixing of heavy-bodied powders, pastes, semi-pastes, granular or liquid materials. Available in a wide range of tank and agitator designs. Capacities from 7.5 to 3850 gallons.

Used for:
Flavored beverages; salt; spices; milk powder; dextrine; starch products; gelatin; tomato products; cake mixes; chocolate and cocoa; puddings; cereals; animal feeds; meat products and sauces; doughnut flours, etc.

DAY RO-BALL SIFTERS

with super-active ball cleaners, lead the field for fast, thorough sifting of wet or dry ingredients. Models for 2, 3, 4, or 5 separations. Often combined with DAY regulating feed hoppers and material conveying equipment.

Used for:
Flours; sugar; salt; dry milk; cocoa; corn products; starch products; seasoning; cottonseed & soybean meal; semolina; candy; prepared mixes; chewing gum; powdered eggs; soup products; animal feeds; tobacco, etc.



DAY DOUBLE-ARM MIXERS

are made in various capacities and models to meet every requirement for light, medium and heavy-duty kneading and mixing. They give fast, thorough dispersions and are the choice of leading food processors.

Used for:
Confectionery products; mixed meats; chocolate; cake mixes; icing; dog food; shredded fish products, etc.

DAY also builds a wide range of other equipment, such as mechanical and airmatic materials conveying systems; homogenizers; hoppers and scales; 3-roll dispersion mills; water coolers, etc. When you select DAY, you choose equipment preferred and proved in thousands of the nation's leading food processing plants. Call in a DAY field engineer, or write direct, for detailed information on your equipment requirements.

The J. H. DAY Co.

Division of The Cleveland Automatic Machine Co.

Quality Mixing, Blending, Milling and Sifting Machines since 1887

4924 Beech Street, Cincinnati 12, Ohio

CIRCLE 98 ON READER SERVICE CARD

For Limited Space

Specify New Viking "Sanitor" Pumps with handy opposite ports

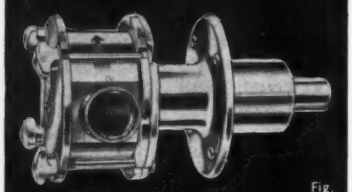


Fig. 8171A

Yes, Viking "Sanitor" pumps are now available with handy opposite ports in 35 and 50 GPM sizes. They're specially designed to fit compact bulk milk trucks and other sanitary installations where space is at a premium.

In addition, you have a pump with positive discharge and smooth, even flow. You can't beat the "Sanitor" for easy disassembling. You can do it in less than a minute. No tools are needed. You have no threads, bolts, deep O-ring grooves or splines in the pumping zone for hard cleaning.

You can depend upon it—the "Sanitor" is the simple, sturdy, truly sanitary pump for milk and other food products.

Send today for new catalog FE MEETS 3A SANITARY STANDARDS

VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A.
In Canada, it's "ROTO-KING" Pumps
Offices and Distributors in Principal Cities
See Your Classified Telephone Directory

CIRCLE 227 ON READER SERVICE CARD

How to Pick Right Strategy

From files of *National Consumer Panel of Market Research Corp. of America* . . . Material is factually correct. Identities of products and companies have been masked to insure anonymity—The Editors*

MARKETING CASE HISTORY OF MONTH

Management's problem

THE GROWING popularity of a particular convenience product, introduced the previous year by a number of competitors, has convinced us that we should enter the market. Since we already have a similar product, which has enjoyed a good sales record for several years, we are tempted to adopt the same general marketing plan to popularize the forthcoming item.

Before going ahead, however, we want to be sure that the existing customers for the older product are in fact the best prospects for the new one.

WHAT WOULD YOU DO?

Management's decision

By consulting the purchase records of families in the National Consumer Panel for the most recent 12-month period, we were able to "match" the consumer franchises for the two convenience product categories. Buying families were carefully analyzed for market concentration, duplicate purchasing, and household characteristics.

Initially, our assumption that we could follow the previous marketing program seemed correct. Both products had similar market concentration patterns with an above-average share of volume accounted for by a few heavy buyers.

Study of purchasers and non-purchasers of the newer item yielded additional interesting information. For example, almost half of the first group also bought the older product. Moreover, they were twice as likely to do so as those in the second group.

The families who used both products showed similar regional, city-size, and income characteristics.

Closer inspection, however, revealed some striking differences in purchasing patterns.

Heavy buyers of the older product were more likely to be heavy buyers of the new item than were medium or light buyers. There were also considerable differences in the types of families most strongly attracted to each product class.

When families were divided according to size, age of housewife, and presence of children, it was discovered that where one product was above-average in penetration, the other one was below-average.

After considering these facts, we decided that the degree of duplication that existed for the products was primarily due to their convenience aspects. There was no apparent relationship between the two in terms of rate of usage or in the types of families most strongly attracted.

Result of action

As a result of these findings, we decided that the marketing plan for our existing product would not adequately serve the new item. Instead, we designed a program more closely related to the specific marketing potentials of the forthcoming product.

* For more information, write to FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

"LUBRIPLATE LUBRICATES EFFECTIVELY IN EXTREME HEAT"

—says KILPATRICK'S BAKERY
San Francisco and Oakland, Calif.

"We have been using a LUBRIPLATE Lubricant as an all-purpose grease for over four years. Bearing trouble was eliminated even where we had excessive heat conditions, and our bearing replacements were cut to a minimum. In all my experience as an engineer, I have never used a lubricant that gave the excellent results accomplished with LUBRIPLATE."

KILPATRICK'S BAKERY
K. K. Weber, Chief Engineer

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

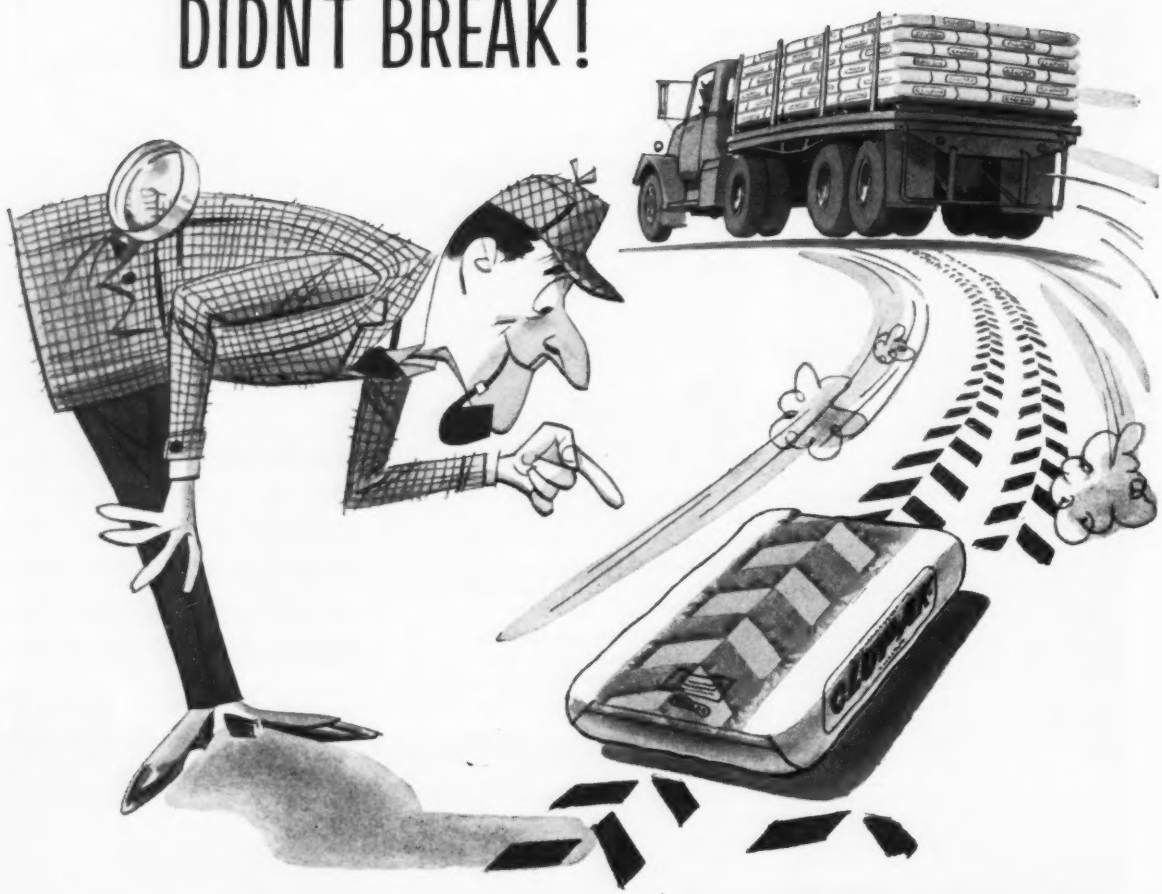
For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

CIRCLE 99 ON READER SERVICE CARD

ELEMENTARY...

EXTENSIBLE **CLUPAK**® PAPER*

THAT'S WHY IT DIDN'T BREAK!



New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all. And multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid strength specifications established by Clupak, Inc. for your benefit.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

MARKETING SIGNALS

Marketing Barometer—Steady

Although the overall economy's performance has rubbed off some of the glitter from the first-of-the-year forecasts, the food industry continues to do pretty well.

First quarter sales of food stores topped '59 by 2.7%—$12.7 billion vs. $12.4 billion. That may not look too impressive, considering that personal income (annual rate) is running 5.7% ahead of last year—$393.1 billion vs. $371.8 billion. But it's still better than the 2.0% gain registered in total retail sales. And eating and drinking places continue to shine—with customers plunking down 6.2% more to dine out than in the first quarter of '59.

On the manufacturing side, food-beverage firms upped sales orders 5.5% for the Jan.-Feb. period—$8.9 billion vs. $8.4 billion. And their output, according to the FRB index, edged up 3.9 points.

Overseas, Grass is Greener

"International" brands are beginning to creep into the food marketer's lexicon. But some pioneers have already proved themselves old hands at that, as witness the just-issued annual statements of National Biscuit and Corn Products.

While overall Nabisco sales climbed 44%, and profits 19%, during the '50s, the firm's international sector did much better. There, volume surged a striking 124%, net an even more impressive 135%. At Corn Products, profits in USA and Canada gained 15% since '55, but elsewhere they showed a spanking 87% improvement.

Cake Mix Market All Mixed Up

If you've had trouble keeping track of the endless parade of new cake mix varieties, chalk it up to the topsy turvy brand situation that followed on the heels of Proctor and Gamble's big-money drive for Duncan Hines. Also, because the total market in '59 showed signs of settling down on a plateau after years of steady growth.

Before the scrambling started, General Mills and Pillsbury enjoyed, roughly, 60% of the business. However, the present lineup finds the two perennials, plus P&G and General Foods, dividing up 80% in practically equal slices.

Looking for New Product? Try USDA

If you're discouraged by the costs of new product development, you'll do well to check USDA to see what's being developed in their research labs. That's where the fast-climbing potato flakes got started.

Here are some items USDA is readying for commercial tests soon: Sweet potato flakes; foam-mat dried fruit juice powders—whose prospects have been enhanced by the success of GF's synthetic "Tang"; and an enriched bread loaf that has 25% added nonfat dry milk vs. the 4% found in commercial pan loafs.

And here's a trend to keep your eye on: Most of the new items being pushed by USDA researchers aim at greater concentration of product.

Merger Fruits Ripen Slowly

Product diversification through acquisition doesn't pay off overnight, as Pet Milk's annual report shows. Although the firm's frozen fruit pies lead the field, the break-even point was finally achieved in '59, four years after they were acquired from Pet-Ritz.

Patient Pet Milk sees a bright future for the line. Last year, new flavors were added, an economy-priced version was introduced to combat private label entries, and a pre-baked line requiring only defrosting was test marketed.

Dailies Fight Back

National newspaper advertising by food and non-alcoholic beverage firms totaled $110.1 million last year, reports the American Newspaper Publishers Assn. This was 2.7% more than in '58 (when outlays dropped 5.3% from '57 levels), and came close to the $113.1 million food-beverage firms spent on network TV last year.

BRIEFS

Away-from-home food business will soar from today's $16 billion level to $26 billion in 10 yr., predicts Gen. Mgr. Homer E. Hooks, Fla. Citrus Commission.

Coupon phase of GMA's "trade practice recommendations," unveiled last Nov., has met strong retailer opposition on West Coast.

What food item is served most often in the home? Coffee, says Market Research Corp. of America, adding that the brew is placed on table 13 times a week, is used by 97% of U.S. families.

Transparent film was rated the favorite packaging feature by 88 out of 104 housewives polled by Nesbitt Assoc. Dairy containers were rated least attractive.

Bowling centers are fast growing outlet for beer sales, says Drewrys, Ltd. Sport has 20 million followers, is gaining 1.5 million new ones a year.

Export market becoming popular testing ground for new products. General Foods will try out instant-type preserves in Western Europe, Quaker Oats will sample pea and lentil soup mixes in Latin America.

Local regulations on frozens still spreading. Philadelphia, which since '57 has had 10 F. ceiling on storage of items, will extend the rule to transportation.

Super markets found it harder to up sales in '59. In annual SMI poll, 72% reported higher volume vs. 78% in '58 and 82% in '57.

Selling challenge of the Sixties is theme of special National Flexible Pkg. Assn. conference, May 23-25, Mich. State Univ., East Lansing.

Thirteen food firms changed ad agencies first quarter of '60, *Advertising Age* reports.

9-10

THESE NUMBERS are especially important to you if you are attending the San Francisco INSTITUTE OF FOOD TECHNOLOGISTS' CONVENTION May 15th to 19th. They are important because they indicate the location of our Booths where the representatives and technical specialists of our firm can be seen and interrogated on any specific problem relating to the flavoring of your goods. Make note NOW that you — or any of your firm's attending representatives — will have this opportunity for a person-to-person exchange of ideas at Booths 9 and 10, and again, if you'll join us for hospitality, at our Presidential Suite headquarters (17th Floor) in the Mark Hopkins Hotel.

REMEMBER the numbers — BOOTHS 9 and 10 ... and we hope to see you there!

FRITZSCHE BROTHERS, Inc.

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MEN & COMPANIES

New Biscuit Chief . . . Moving up to president's post at Keebler Biscuit Co., Philadelphia, is Wendell P. Nolan, former president and general manager of Merchants Biscuit Co., Omaha.

He succeeds retiring John Y. Huber, Jr., who also held a board position since 1937.

New president began his career as a student chemist with Iten Biscuit Co., Omaha,

John Y. Huber Jr.

in 1932. He was later associated with bakeries in Denver and Kansas City, before returning to the reorganized Iten-Barmettler Co. Following acquisition by United Biscuit in 1941, firm was renamed Merchants.

Mr. Nolan served there as general superintendent, v.-p. and production superintendent, and executive v.-p. He was elected president in 1955.

Wendell P. Nolan

Tops in Technology . . . Honored for contributions to food technology is Dr. Ernest H. Wiegand, named recipient of IFT's '60 Nicholas Appert Award.

Former head of Dept. of Food Technology at Oregon State College, he now serves as a consultant to the industry.

Dr. Arnold H. Johnson, research director of National Dairy Products Corp., was named winner of the Babcock-Hart Award for contributions to public health and nutrition. He will receive an engrossed plaque and $1,000 from the Nutrition Foundation.

Merck & Co. and American Meat Institute Foundation are '60 joint winners of IFT's Food Technology Industrial Achievement Award. Each

Dr. Arnold H. Johnson

was cited for work in use of Pediococcus cerevisiae as a starter culture for controlled fermentation of sausage.

Judged to have made major contributions to the development are R. P. Dudley, Merck, and Dr. R. H. Deibel, Dr. C. F. Niven, and C. D. Wilson, AMIF. Plaques will be presented at 20th Annual IFT meeting, San Francisco, May 15-19.

Personnel

Mattison W. Alderman has joined Sealtest Foods Div., National Dairy Products Corp. as new products manager.

W. F. Allewelt, general manager of Turlock Cooperative Growers, Modesto, Calif., is new president of Canners League of Calif.

Henry C. Arnest, grocery products sales v.-p., is now board member at Carnation Co.

George J. Bozzini takes over transportation and warehousing duties as director of traffic for Dole Hawaiian Pineapple Co.

George Brown is new eastern divisional sales manager for Geo. A. Hormel & Co. Area sales supervisors named are **Dan Sproul,** central southwest; **Ray Asp,** midwest; and **James Hall,** central southeast.

Dr. Arthur J. Harriman, former technical research director, is now director of product exploration and research liaison at Thomas J. Lipton, Inc.

too much vinegar...

spoils a salad ...and endangers a fine product's reputation

That's why makers of fine vinegars use WS snap-on liquid dispensers.

If proper dispensing is important to your product's acceptance, WS liquid dispenser fitments may be the perfect answer. Check with your WS salesman.

Check up on WS pouring rings, sifter tops, and custom-molded caps, too.

Write us or phone collect for full information or immediate service.

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Los Angeles, Calif.	Pleasant 2-0791
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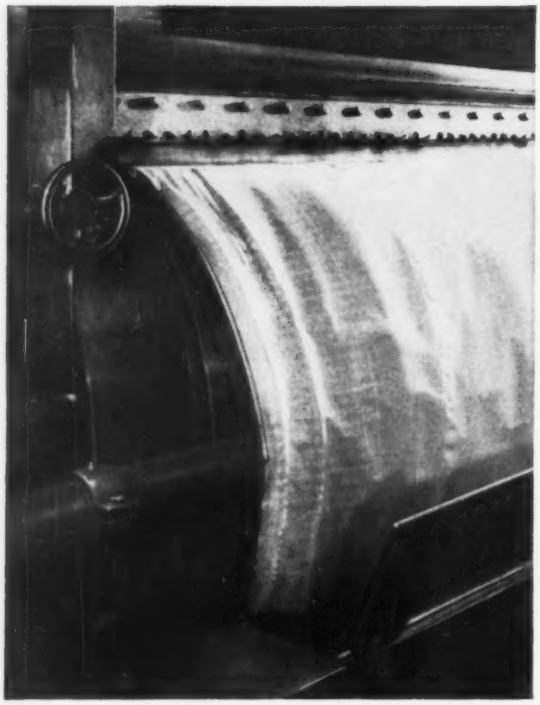
BUFLOVAK DRUM DRYERS



for cereals, syrup, vegetables, starch, yeast, baby foods, extracts, waste

Whatever your material in process may be, Buflovak Equipment will provide the way to the most profitable operation. ■ Vacuum or atmospheric, single or double drum, Buflovak can job-tailor the dryer for your product. ■ For details, write for Catalog 384, Buflovak Equipment Division, 1631 Fillmore Ave., Buffalo 11, New York.

Buflovak Equipment Division

BLAW-KNOX

At same time, former manufacturing director **Robert B. Law** moves up to manufacturing v.-p.

Ned W. Calkins, former v.-p. and director of marketing for Goebel Brewing Co., Detroit, has opened food & beverage industry consultant offices in Chicago.

Arthur F. Cunningham has been named assistant to the president at Nalley's, Inc., Tacoma.

James F. Curtis is now v.-p., overseas operations, and **Joseph F. Hales** is technical services v.-p. at Royal Crown Cola Co.

Clayton C. Daley, Drake Bakeries, Inc., Mamaroneck, N. Y., is new president of Amer. Soc. Bakery Engineers.

Eugene C. Gillett is technical advisor to the vice-president, and **Roy R. Huckell** is assistant plant mgr. of the Crockett refinery of California & Hawaiian Refining Corp.

Albert Hodor is new evaporated milk product manager at Pet Milk Co.

John F. Hurley, assistant to president at Kellogg Co., is now board v.-p. **Dan M. Harrison** moves up to v.-p. and general production mgr., and **Norman Bristol** takes over as secretary and assistant general counsel.

A. Z. Kouri has resigned as executive v.-p. in charge of consumer foods at General Mills.

Charles G. Mortimer, chairman and chief executive of General Foods Corp., was elected to board of Ford Motor Co.

M. J. Martin is new president of Penick & Ford, N. Y. C., succeeding retired **Dr. J. M. Widmer.**

H. E. Olson is new president of Albers Milling Co., Carnation Co. subsidiary, succeeding **Fred W. Hoover, Jr.,** who has resigned. **G. A. Ensminger** is new executive v.-p.

R. O. A. Petersen succeeds **William Yantis** as president of Bunte Bros. Chase Candy Co.

Theodore Rosenak, former advertising v.-p., has been upped to executive v.-p. at Pabst Brewing Co.

Norton Simon succeeds retired **Russell J. Miedel** as president of Hunt Foods & Industries, Inc.

A. E. Symons, sales manager of Hershey Packing Co., Snohomish, Wash., is new president of Northwest Canners & Freezers Assn.

Royce C. Wood, board chairman of Groce-Wearden Co., Victoria, Tex., is new president of U. S. Wholesale Grocers' Assn.

Industry

California Packing Corp. and **Van Camp Seafood Co.** have abandoned proposed merger plans, according to respective presidents Roy G. Lucks and Gilbert Van Camp, Jr.

General Foods directors have voted to recommend an increase of authorized common shares without par value from 15 to 40 million, and to split the stock two for one. GF also announced an agreement to acquire assets of **California**

RESEARCH & ENGINEERING CENTER, to be under construction July 1, will be adjacent to Food Machinery & Chemical Corp.'s San Jose facilities. FMC reports it will house mechanical, electronic, physics, and materials processing labs, as well as engineering and administrative offices for some 300 personnel.

Photo courtesy of United Air Lines

DOWNTIME

Costs start climbing the minute a fork truck goes out of service. The national average for truck downtime is conservatively estimated to be $16.48 per hour. An important reason why fast, qualified parts service is essential.

It's why Clark dealers offer you the largest inventory of parts in the industry. It's why Clark maintains a 16,000 mile private wire communication system. It's why Clark has built a multi-million dollar parts warehouse near Chicago's Midway Airport.

Everything in the Clark service system is geared to speed. Vital materials handling equipment must be back on the job *fast!* To assure you of fast service Clark provides you with over 117 service facilities throughout the nation . . . each carrying a complete parts inventory. To back this up, the Clark Central Parts Depot maintains an inventory of over 5 million parts . . . emergency parts that can be air-shipped to any part of the country in a matter of hours. *Only* Clark offers you this service.

Want to see how it's done? A colorful brochure and a film strip describing this service system are available through your local Clark dealer. You'll find him listed in the yellow pages under "Trucks, Industrial." Or, if you prefer, write direct to: Clark Parts Service, Clark Equipment Company, Battle Creek, Michigan.

CLARK® EQUIPMENT

For full details, circle 77 on reader service card

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Another Finnell First!

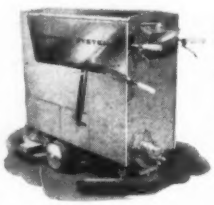
CUSTOMER / DESIGNED

BATTERY-POWERED SCRUBBER-VAC

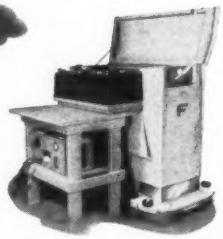
in two sizes MARK 20 MARK 26

for quiet, efficient, continuous scrubbing

Five years of research, engineering, and on-the-job testing of various pilot models have enabled *Finnell* to offer a *battery-powered combination machine* that is truly *customer/designed!* Incorporating the features *most wanted* by a cross section of business and industry, the unit *performs quietly* . . . has *compensated motor* . . . *specially designed battery rack* to eliminate lifting out batteries . . . *simplified controls* to assure greater ease of operation . . . *accessibility of all parts* to permit safe, easy inspection and maintenance . . . *sturdy gear system* to reduce maintenance costs. And like all *Finnell Combination Machines,* the unit applies cleanser, scrubs, and picks up—*in one operation.* Independence from power lines enables the machine to go wherever the operator guides it . . . *scrubbing continuously.* The *Mark 20* cleans up to 15,000 sq. ft. per hour; the *Mark 26,* up to 21,600 sq. ft. per hour. Brushes are counterrotating to eliminate torque. Each unit is powered by four standard 6-volt, 25-plate, 210-ampere batteries which permit up to eight hours of operation without recharging. *Finnell* also makes *battery-powered combination machines* in larger sizes.



No switches to set for fast or slow — pressure of hand on clutch lever adjusts speed (up to 180 lineal fpm). Variable brush pressure to meet specific needs.



A compact battery charger is included with each unit as standard equipment. Batteries can be charged on the machine or rolled out on a charger bench.

For consultation or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 5705 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.

Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

Vegetable Concentrates, Inc., Huntingdon Park, Calif.

Granny Goose Foods, Oakland, Calif., has announced purchase of Dantoy Plastics, Burlingame, Calif., manufacturers of rigid plastics.

John Morrell & Co. has purchased **Maurer-Neur, Inc.,** Kansas City meat packing firm, according to Arthur B. Maurer and C. C. Neuer of Maurer-Neuer, and W. W. McCallum, Morrell president.

Rath Packing Co. has begun construction of a $1,250,000 plant in Houston.

Associated Industries

Air Reduction Co. has established a Customer Service Lab at Lakeland, Fla., to develop inert gas applications for protecting citrus quality.

Creamery Package Mfg. Co., Chicago, has promoted Dan C. Roahen to research director.

Dairy Industries Supply Assn. elected R. O. Davison, Kelco Co., as new president. Executive v.-p. Roberts Everett received DISA honor plaque.

Du Pont Co. will provide facilities for production of "Budium" polybutadiene interior coatings for food and beverage cans at its Fort Madison, Ia., plant.

Dobeckmun Co. Pres. Thomas F. Dolan has resigned after 33 yr. service. John G. Staudt is new president.

Fibreboard Paper Products Corp. has formed a new manufacturing and merchandising unit, the Tube & Can Div.

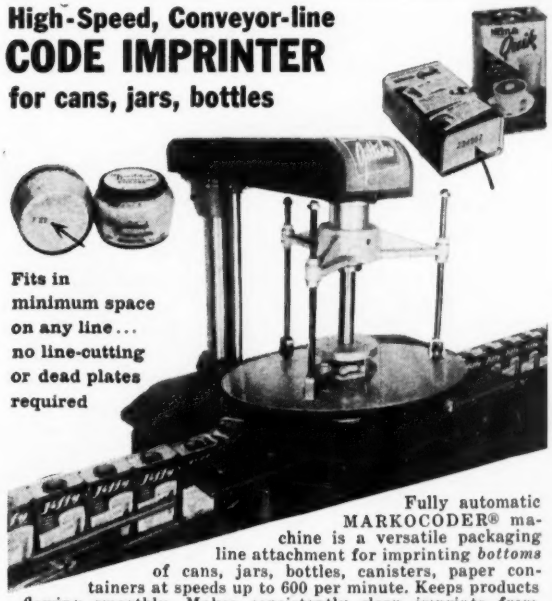
Folding Paper Box Assn. has named D. A. Forsberg, **Forsberg Paper Box Co.,** new president.

Kartridg Pak Co., Franklin Park, Ill., has purchased **Alpha Engineering Works, Inc.,** Mt. Prospect, Ill., pioneers in development of aerosol filling equipment.

Monsanto Chemical Co. elected Charles H. Sommer president and named Charles Allen Thomas board chairman.

Phillips Chemical Co. has expanded plastics operations to include marketing of medium and low density Marlex poly ethylene resins.

High-Speed, Conveyor-line
CODE IMPRINTER
for cans, jars, bottles



Fits in minimum space on any line... no line-cutting or dead plates required

Fully automatic MARKOCODER® machine is a versatile packaging line attachment for imprinting *bottoms* of cans, jars, bottles, canisters, paper containers at speeds up to 600 per minute. Keeps products flowing smoothly. Makes consistently clean imprints from rubber type and fast drying fluid ink. Designed for quick code changes, simple maintenance, easy adjustment for different size containers. Install it yourself in a few hours.

First and foremost in automatic production line CODING, MARKING and IMPRINTING machines — Gottscho®

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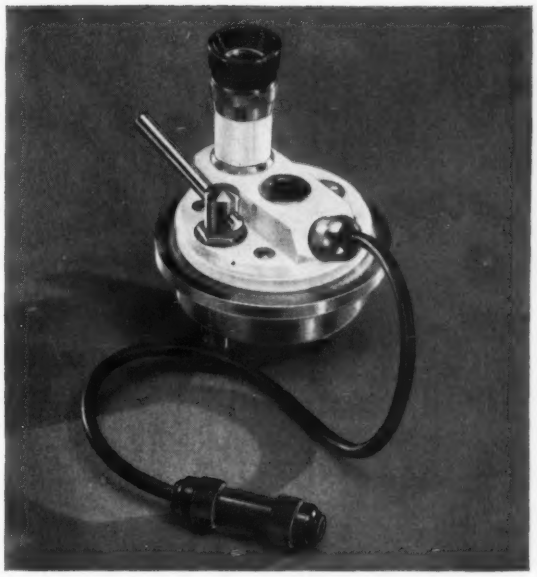

AO's Goldberg Process Refractometer Prevents Waste ... Increases Profits

This in-stream Refractometer can be mounted in wall of process vessel, evaporator, vacuum pan, product pipe line or other location where continuous reading is desirable. Quickly determines total soluble solids in turbid and dark-colored concentrates such as jellies, jams, purees, juices and syrups.

1. **Prevents profit loss:** Determines exact endpoint of cooking batch by providing continuous, in-process readings of total solids. Prevents profit loss due to soluble solids "give away" by over concentration.

2. **Prevents product waste:** In-process readings on *hot* product eliminates old-fashioned external sampling with its consequent product waste and time loss. Savings in product alone, in most cases, will pay for the instrument in one season.

3. **Prevents errors:** Since product is always tested in-process, errors due to evaporation, temperature changes or opacity are eliminated. Readings are not affected by viscosity, foam, air bubbles or pulp and there's no need to correct for temperature differences between refractometer and process vessel. Accurate readings can be taken by anyone... no skilled technicians required.

4. **Three Brix ranges available:** 0-25%; 12-72%; 36-82% total soluble solids. Withstands pressure of 40 lbs. and temperatures ranging up to 250°F.

For further information write for Brochure SB10125

SPENCER

American Optical Company

INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

CIRCLE 107 ON READER SERVICE CARD

SA—streamlined balloon jacket design. Extra large diameter provides greater heating surface. Sizes 15 to 500 gallons. Constructed for steam working pressures of 40, 90 and 125 pounds.

SA MIX COOKER—has single or double motion agitator with or without hydraulic lift. Agitator lifts easily and smoothly out of cooker. Sizes 30 to 500 gallons.

CW—designed to process batches up to 150 gallons. Positive worm gear. Handwheel gives control of capacity loads while tilting. Large diameter kettle gives fast even cooking.

BUILT-IN QUALITY

. . . IN HAMILTON SPECIAL OR STANDARD KETTLES ASSURES LOWER PROCESSING COSTS

PC—stainless steel pressure cooking kettle for meat and poultry processing. 90 p.s.i. in jacket and 15 p.s.i. in kettle. Quick opening latches. Top is lifted by eccentric lever. Sizes 30 to 250 gallons.

HV—vacuum cooker from 150 to 500 gallons. Hinged manhole provides access to the inside. Available with a mixer—circulator can be installed to increase heat transfer and agitation.

VT—vacuum cooker has no equal for small batches. Tilting top easy loading. Sizes 30 to 150 gallons. Jacketed for 90 p.s.i. steam working pressure.

SPECIAL—PC Style Pressure type mix-cooker. Jacket to full 200 gal. level. Plate type heating-cooking coils arranged to act as agitator baffle plates. Entire unit removable for easy cleaning.

Hamilton offers the right kettle for any mixing or cooking job. The Cost? Reasonable and economical in the light of finished and polished fabrication. Sanitation guaranteed. Careful competent workmanship and constant inspection assures you of quality that is built-in. We'll work from your prints or create them for you on our drawing boards. Write for free Hamilton Kettle Catalogue.

ESTABLISHED 1876

HAMILTON Kettles

COPPER AND BRASS WORKS — DIVISION OF BRIGHTON CORP.

820 STATE AVENUE, CINCINNATI 4, OHIO

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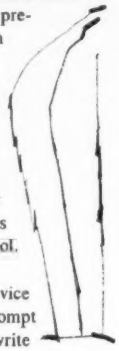
Jefferson Chemical is your best source for high purity

U. S. P. PROPYLENE GLYCOL

Most Versatile Polyol for Use in Foods, Flavors and Extracts

U. S. PHARMACOPOEIA Grade Propylene Glycol has low toxicity and excellent solvent, hygroscopic and preservative properties which make it preferred in a great variety of food processes. Food flavor, color or emulsion solvent; flavor extractor; humectant in packaged food products . . . these are a few of the proved applications for U.S.P. Propylene Glycol.



For helpful technical service on any application, or prompt delivery-price information, write to Jefferson Chemical Company, Inc., 1121 Walker Ave., P. O. Box 303, Houston 1, Texas.

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Ethylene and Propylene Oxides, Glycols, Dichlorides • Ethanolamines
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FE SERVICE CENTER

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Classified ..... p. 142
Advertisers' Index ..... p. 146
Reader Service ..... Back of Book

NEW EQUIPMENT & SUPPLIES

Sturdy, Economical Pump

Described as "rugged unit at moderate price," new Metriflow pump is designed for wide range of metering applications. Particular suitability is noted for handling slurries and viscous liquids of all kinds.

There are four standard sizes with respective maximum capacities of 10, 18, 36, and 54 gpm. at pressures to 300 psi. Further, duplex pumps are available for doubling these capacities.

Gear case and pump body are flanged together in unitized, completely sealed construction (there are no packing glands). Solution head is readily removed for inspection and cleaning or for interchanging for different services. Control knob adjusts discharge capacity.—*The Madden Corp., 1345 Jarvis St., Chicago.*

Circle 306 on Reader Service Card

Case-Masking Aerosol

New opaque spray—tan colored to match corrugated cases—is quickly applied by aerosol. Thus, old stencilings, print lines, labels, etc., are readily obliterated to "fresh up" used containers and give new marking surfaces. Moreover, "Stencil-Kover", as it's called, permits fast, easy correction of any stenciling errors.—*Reynolds Ink, Inc., 4502 Euclid Ave., Cleveland 3.*

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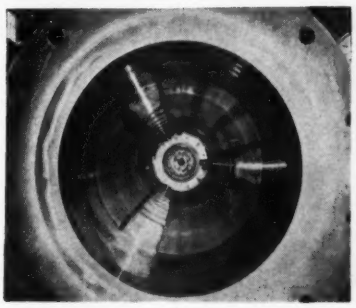

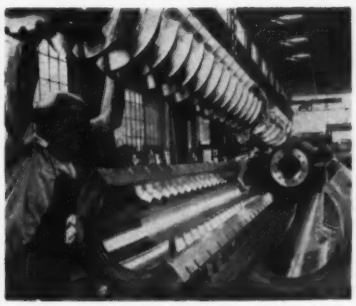

Closed, 40-ft. barrel (left) opens to two halves, allowing hydraulic installation of 16-ft. mixing screw (right), which can rotate at 30-90 rpm.

Giant Continuous Mixer Boosts Capacity

Huge, 40-ft. continuous mixer employs broken-flight screw mounted in stainless steel cylindrical barrel (16-in. dia.) with series of mixing pins.

Screw rotates at 30-90 rpm. and reciprocates (back and forth) 20-30 times/min. Dual motion provides pulsating discharge used in combination with extruder or pelletizer to produce desired shapes. Barrel or screw can be used as heat exchangers to heat or cool during mixing.

Chamber's teeth and screw flights are placed extremely close for fine material dispersion.

Advantages cited for Ko' Kneader are: Excellent dispersion of ingredients; high output (10,000 lb./min.); easy cleaning; flexibility; and handling of both dry and wet product applications.

Potential applications include cereals, meat, bread doughs, and cake batters, as well as extrusion of candy and similar items.—*Baker Perkins, Inc., Saginaw, Mich.*

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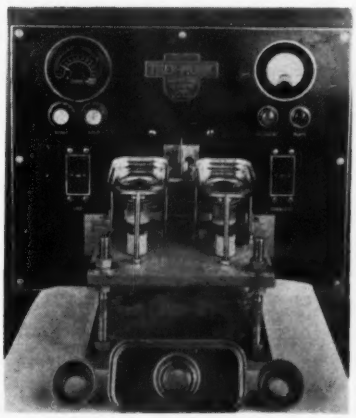

Measures Solder Flow

Assurance of perfectly soldered joints in containers for perishable foods is possible with this Ther-Monic unit and specially designed fixture.

It consists of 1½ kw. generator and two-place coil attached to single fixture. Ring eliminates waste by providing only needed amount of solder. Perfect control of heat prevents damage to tin and contents spoilage.

Coil solders spouts to covers at rate of 240 unit/hr.—*Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.*

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Want more information on any items? Just circle the key numbers on Reader Service Card, back of book

This is only one proof of **GAYLORD** *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?

Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

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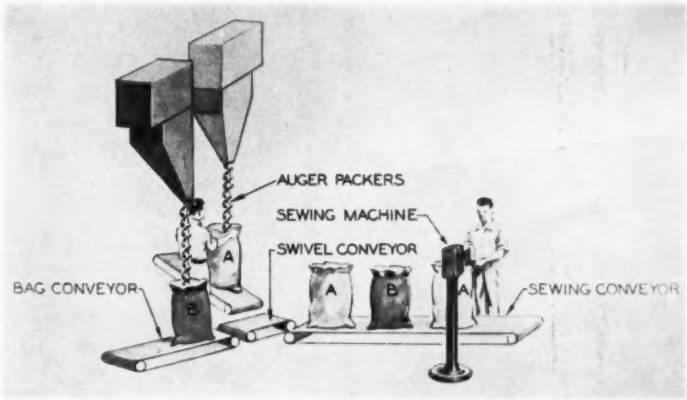
HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST



Ups Bagging and Sewing Capacity

Up to 16 100-lb. bags of flour/min. have been bagged and sewn in field tests of new system which combines two flour packers and a Y-type arrangement of four flat belt bag conveyors.

Heart of system is a "swivel conveyor" which acts automatically to channel two bags into a single sewing line. Conveyor receives bag from one line, moves it to sewing conveyor, and turns to receive bag from other line.

System eases handling by delivering all sewn bags to one point.—*Richardson Scale Co., Clifton, N. J.*

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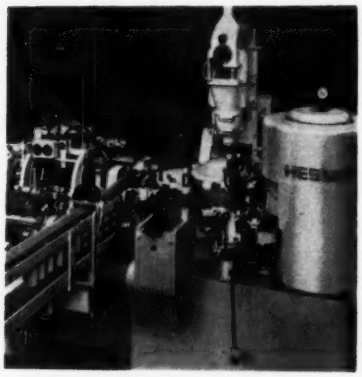


German Vac-Type Cartoner

Vacuum on order of 96% is reported pulled by this packaging machine, which produces a tight bag-in-carton unit for coffee or similar products.

Combination package is formed, filled, evacuated, and sealed on machine in continuous operation.

Bag material (of film or foil) is fed from reel, while outer carton is magazine-fed. After filling, bag is partially heat-sealed, with vent left for evacuation in a separate turret. Following this step, bag gets final heat-seal, carton top is glued, and complete package is belt-discharged.

Machine operates at 60 packages/min. Maker says that only standard workforce and floorspace are required.—*Fr. Hesser Maschinenfabrik Aktiengesellschaft, Stuttgart-Bad Cannstatt, West Germany.*

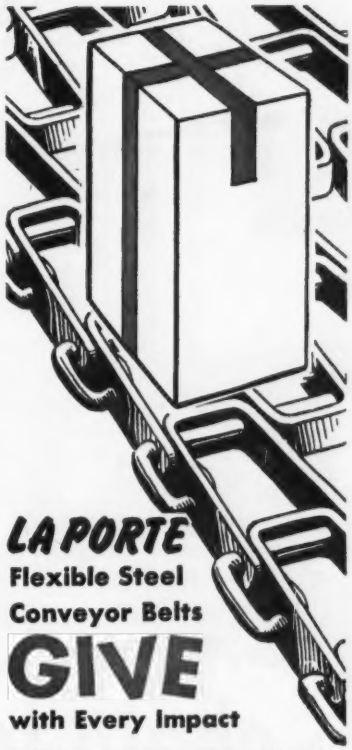
Circle 311 on Reader Service Card

Easy-Fix Heating Elements

New concept—the "do it yourself" heating element—is called Heetstrip. Product is thin sandwich of dielectrically treated glass cloth employing a heat-dissipating film that provides a precisely uniform heated surface.

Strips are available in various stock sizes (photo), also are supplied by company to user's specifications. To simplify applications, one side of element has thermo-sensitive adhesive that bonds to surface.—*Thermolab Corp., 6940 Farmdale Ave., North Hollywood, Calif.*

Circle 312 on Reader Service Card



LA PORTE
Flexible Steel Conveyor Belts
GIVE
with Every Impact

WITH knee-action resiliency, La Porte Conveyor Belts flex under the shock and pressure of heavy loads on the receiving platform, at the loading hopper and the shipping dock. Yet they maintain a perfectly flat surface for products in process and containers empty or filled.

The open-mesh design keeps products from rolling off and permits the circulation of air and liquids around products in process. It also speeds up drainage and facilitates sterilizing with steam gun by one man while in motion. La Porte Belts are easily installed.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

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The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

chain lubricants

specially formulated with "built-in" cleaning action

Any one of four specialized Oakite lubricants will, in a single operation, (1) keep your conveyor chains clean . . . and (2) provide exactly the right slip to reduce gate pressure, help prevent jam-ups and bottle breakage. That's *clean lubrication* the Oakite way.

Users also report 25% better "mileage" than old-fashioned bar soap, because down-time on maintenance is substantially decreased: Chains last longer . . . and even the frequency of motor burn-outs is reduced. You get all these "pluses" in each Oakite lubricant described below.

OAKITE 6 is a jelly-like lubricant, long proved superior for clean, chatter-free operation.

OAKITE FM 186, a low-foaming liquid, excels in hard water areas and where spillage is acidic.

OAKITE LC 106 is a dual-action paste lubricant which, because of its slow-dissolving properties, lasts longer.

OAKITE 59 is an oil emulsion that won't cake or gum in sub-freezing outdoor weather.

With Oakite chain lubricants comes the loan of a wide variety of efficient applicators. Each applies the right dosage in the right place . . . automatically.

The big PLUS in Oakite

Working with Oakite is like adding a cleaning engineer to your staff. It brings a wealth of experience . . . the results of latest research in cleaning and sanitation. For free Bulletin F-10347 on chain lubrication, write Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE
over 50 Est. 1909 years' leadership in industrial cleaning
SCIENCE

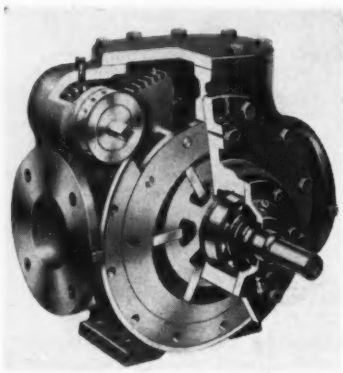
New Equipment & Supplies

'Hot Seat' for Insects

This insect electrocutor has high-voltage grid and black light which attracts night-flying bugs and kills instantly.

Unit is particularly suitable for use in open or outside-premise areas of food plants.

Wire mesh safeguards against hazards of grid being touched by birds, pets, or people.—*Ram Meter, Inc., 1100 Hilton Rd., Ferndale 20, Mich.* **Circle 313 on Reader Service Card**

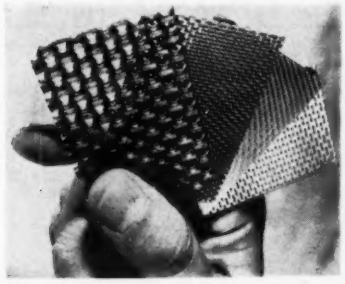


Simplified Proportioner

New line of proportioning pumps needs no variable speed drives to change delivery from zero to full while running at constant speed.

Flow variations are controlled instantly by a graduated dial turned manually or automatically, with optional systems for special applications. Vari-Flo pumps can also reverse flow to discharge lines without changing rotation or speed.

Units can be combined with standard components to produce any desired blend ratio of base stocks.—*Blackmer Pump Co., Grand Rapids, Mich.* **Circle 314 on Reader Service Card**



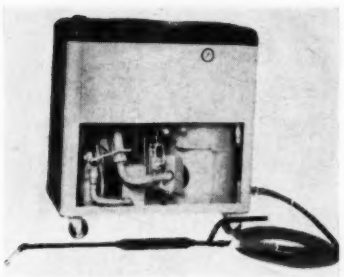
Hi-Throughput Screens

Special Conidure pierced-metal sheets are offered for specific screening and dewatering applications in canning, milling, sugar refining, and other food-processing fields.

The patented-process sheetings (photo shows samples) reportedly give greatly multiplied screen life in gravity and centrifugal separators. Available in various metals (as stainless steel, aluminum, bronze), sheets have tiny shovel-like humps on their working sides designed to guide material to openings for higher throughput.

Supplied are sheets up to 31 in. wide or formed into sheared shapes, cones, segments, or cylinders. If desired, material can be tensioned and fabricated with clamping grooves or turned edges. Choice of pattern, finish, and hole size depends on application.—*Cross Perforated Metals Div., National-Standard Co., Carbondale, Pa.*

Circle 315 on Reader Service Card



Top-Action Steam Cleaner

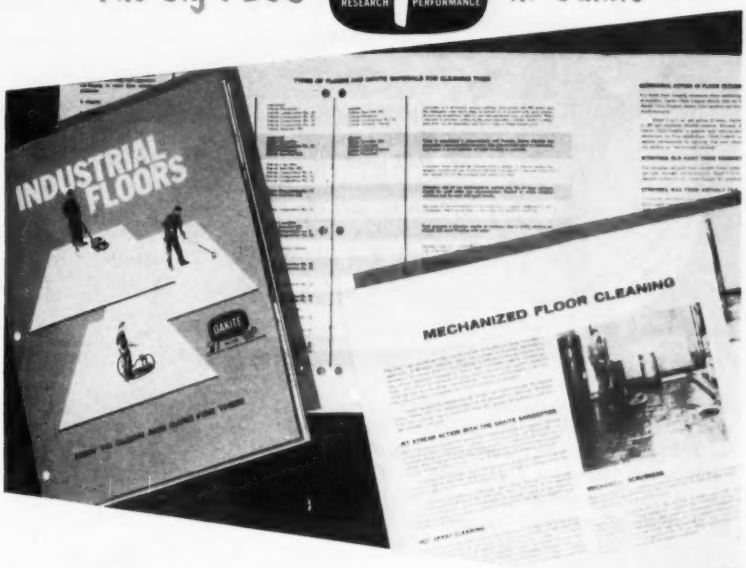
Latest oil-fired steam cleaner is designated Model 130—since it delivers hot solution at a high 130 gph.

Employed is new nozzle designed for stepped-up cleaning efficiency. In addition, unit is narrower and lower (45x21x43 in.) so user can move it more readily around crowded plants.

Tricycle and trailer mounts are optional. Also available is gas-fired stationary unit.—*Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif.*

Circle 316 on Reader Service Card

The big PLUS SERVICE + EXPERIENCE RESEARCH PERFORMANCE in Oakite



floor cleaning

short-cuts detailed in FREE booklet

To really put wings on your floor cleaning program, this detailed booklet gives you up-to-date information on Oakite *mechanized* methods . . . methods that take the toughness out of floor cleaning . . . methods that combine mechanical force with detergent action to blast loose the heaviest soils . . . methods that obtain consistently fine results, reduce detergent consumption and save time.

This 10-page booklet also features a valuable chart—the backbone of an Oakite Floor Maintenance Plan fitted to your individual needs. Simply check this chart for your type of floor . . . and on the same page, you'll learn about the "matched" Oakite detergent, specifically formulated for your floor-and-soil problem.

For wood, concrete, tile, metal, masonite and other kinds of flooring, the recommended Oakite cleaning procedure is fully described. Follow this procedure and you can be sure of maximum cleanliness, minimum floor wear, greater safety and less chance of costly reconditioning.

The big PLUS in Oakite

Whether your problem is floor maintenance or plant-wide sanitation, Oakite can help you do a better job . . . open up new avenues of economy. For free bulletin on floor maintenance, write Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE SCIENCE
over 50 Est. 1909 years' leadership in industrial cleaning

CIRCLE 113 ON READER SERVICE CARD 113

Sticking Problems?

use

SLIPICONE

silicone release agent

ON HAND-IRON SEALING BARS

SLIPICONE® makes sticky spots slick . . . prevents adhesives, packaging materials, foods and food products from sticking where they're not wanted. SLIPICONE keeps equipment clean, cuts downtime and maintenance costs, speeds operations . . . SLIPICONE saves you time and money!

SLIPICONE is nontoxic, won't attack any surface, and is unaffected by temperatures from —40° to 400° F . . . won't gum-up or run-off equipment when heated. Try SLIPICONE, the Dow Corning silicone release agent, now . . . and give your sticking problems the slip!

Get SLIPICONE from your paper merchant, packaging materials supplier, or write to Dept. 5505a

Just spray or wipe it on: Sold in 12 oz. aerosol cans, 2 and 8 oz. tubes, 10 lb. cans.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

CIRCLE 230 ON READER SERVICE CARD

For inexpensive filling . . .

the **SIMPLEX** TWIN

Top efficiency with this fully automatic Simplex Model T. A universal machine to handle cartons, cans or jars. No can no fill, completely adjustable, easy to clean.

Fills 25 to 80 containers per minute! Range from 2 oz to a gallon! Handles liquids and semi-solids!

Write for circular on this 2-piston model and other Simplex fillers. Dept. FE.

F. L. BURT COMPANY

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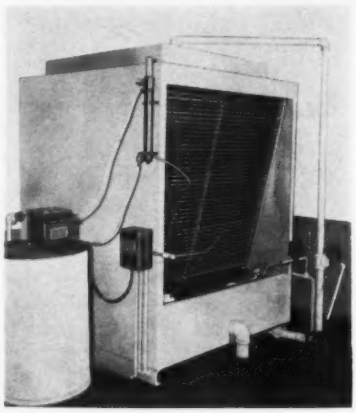


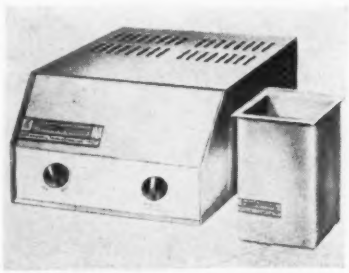
Controls Water Treatment

Water treatment feeder and controller is designed especially for use with circulating systems to prevent corrosion, mineral scale, slime, and algae.

Unit (Hydrotrol) automatically adjusts "bleed off" and chemical feed so that rates of both are always in direct proportion to rate of water evaporation.

Cited are savings in water analyses, control labor, chemicals, and water. Feeder is designed for use with either acid or alkaline treatments.—*Heller Labs, Inc., 124 Fort Lee Rd., Leonia, N. J.*

Circle 317 on Reader Service Card



Low-Price 'Wave' Cleaner

Seen widening the use of ultrasonics for more efficient cleaning of key equipment parts is this new Disontegrator System Forty, called first such unit to sell for under $100.

Maker says ½-gal.-tank model will disintegrate and remove more than 50 different kinds of soils or contaminants in mere seconds. Unit incorporates 40w. generator capable of producing frequency of 90,000 cycles per sec., termed ideal for small-parts cleaning.—*Ultrasonic Industries, Inc., Albertson, L. I., N. Y.*

Circle 318 on Reader Service Card

(*Continued on p.* 118)

OTHER OLIN PACKAGING PRODUCTS: **CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER**
Write for illustrated Brochure "The Olin Carton Service"

It takes more than paperboard to make

OLIN CARTONS

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• printing skills
• modern equipment • resources
• basic research • quality control
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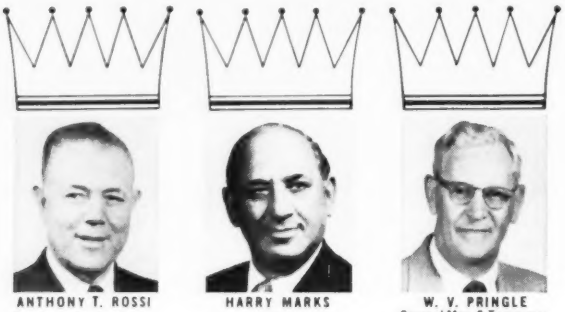

ANTHONY T. ROSSI
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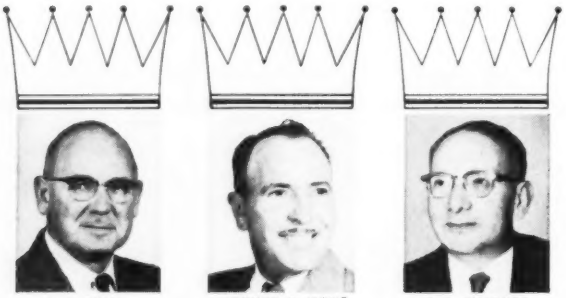
Bradenton, Fla.

HARRY MARKS
M & M
Transportation Co.
Somerville, Mass.

W. V. PRINGLE
General Mgr. & Treasurer,
Rockingham Poultry
Mktg. Cooperative, Inc.
Broadway, Va.



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King of Transport Refrigeration

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No matter what your refrigeration problem, you, too, can depend on Thermo King. Thermo King offers you fully automatic cooling and heating in the size unit and power plant you need. Self-contained units are powered by gasoline, diesel, propane, or electricity. 23 years of specialized experience guarantees you *most capacity at least cost*. Interested? Write us for more details.

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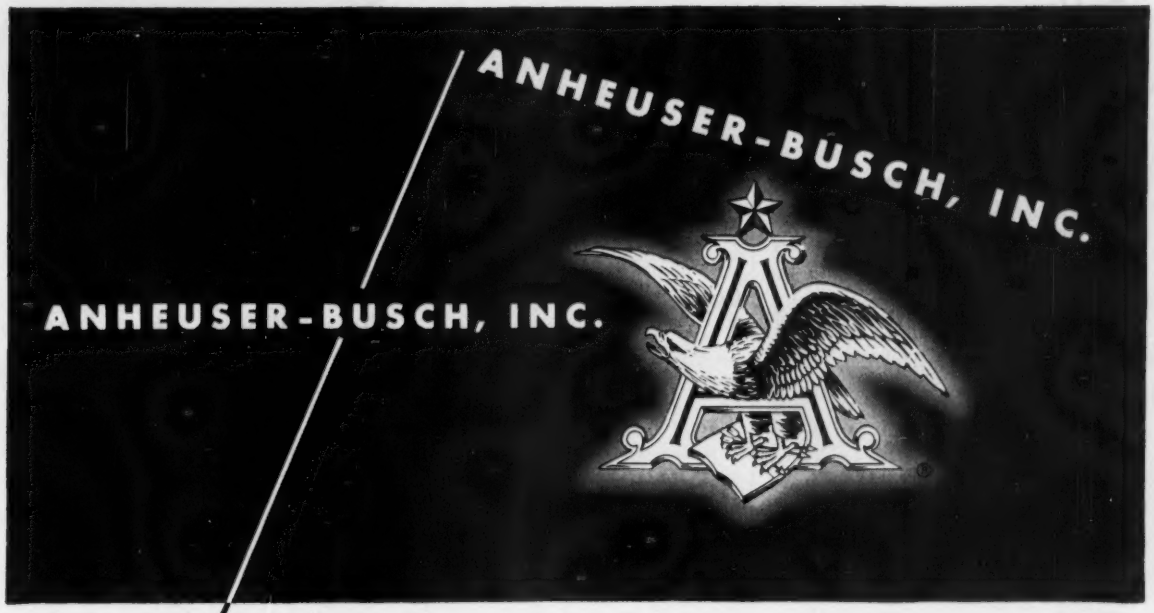

Sign of highest quality for the food industry

The A & Eagle, found on every shipment of Anheuser-Busch corn starch and corn syrup, has always meant highest quality:

A-B® Corn Starches

A-B® Corn Syrup Unmixed—Regular Conversion

A-B® Corn Syrup Unmixed—Intermediate Conversion

BUD-SWEET* Corn Syrup Unmixed—High Conversion

Now, as a result of our continuing product research, we are announcing an addition to our line of corn syrups:

HI-FI* Corn Syrup Unmixed—Extra High Conversion

Maximum sweetness coupled with low viscosity make HI-FI corn syrup an ideal ingredient for the food processor.

We invite your inquiries concerning any of these fine products.

ANHEUSER-BUSCH, INC.
Bulk Corn Products Division
General Offices: St. Louis, Mo.

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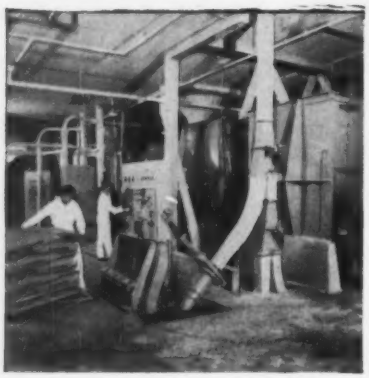
Problem:

To boost starch and gum production while cutting operating costs



Solution:

SPROUT-WALDRON

UNIT MACHINES AND SYSTEMS

When Morningstar Paisley executives decided to move activities to their new plant at Hawthorne, N. J., they demanded a system meeting these specifications: extreme versatility, no dust nuisance, protection against contamination, low handling and operating costs, stepped up capacity.

The answer was found in a packaged processing system involving Sprout-Waldron machinery for crushing, mixing, grinding and sifting; plus a series of four negative pressure pneumatic conveying systems.

Blending and bagging of starch, gum grinding and gum granulation are now being accomplished with a minimum of handling and maximum of efficiency. Operating costs are down, capacity up. For the full story ask for Bulletin F-19.

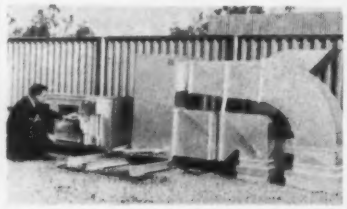
CW/107

SPROUT-WALDRON

Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

New Equipment & Supplies



Conditions Air for Less

New concept in air-conditioning, utilizing an electric pump system, has saved Atomic International, Canoga Park, Calif., $200,000 initial cost in firm's 200,000-sq-ft. plant.

Installation consists of several large heat pumps mounted in roof (typical 5-ton unit pictured above), with single ducts distributing air, heated or cooled by each unit, to various zones of the building.

System offers easy accessibility, and failure of one unit affects only one are of the building. The capacity is easily increased by addition of extra units.

Special valve reverses refrigeration cycle, permitting heating as well as cooling by manual control. Other features are carbon by-pass filters, glass strainer-mat dust filters, and specially-designed window assembly. —*Albert C. Martin & Assoc., 333 S. Beaudry St., Los Angeles.*

Circle 319 on Reader Service Card

BRIEFS

Versatile Potentiometric Recorder is termed adaptable to all titration problems (pH, Redox, precipitation, etc.). Made by Switzerland's Metrohm Ltd., this Potentiograph, as it's called, has advantage of automatically plotting endpoints by recorded curves. Distributor—*Chicago Apparatus Co., 1735 N. Ashland Ave., Chicago.* (320)

New Water-Conditioning Unit, the Aqua-Mag, acts against scale and corrosion by running water through magnetic fields and creating a physical change in dissolved salts. Cost savings and prolonged system life are accented by maker.—*Marginator Co., 1121 W. Magnolia Blvd., Burbank, Calif.* (321)

Special New Stopwatch is handier for use in various food lab and line checks. It affords doubled capacity through addition of large central minute register giving full 60-minute elapsed-time readings.—*Heuer Timer Corp., 441 Lexington Ave., N.Y.C. 17.* (322)

SARCO

Here are 7 Sound Reasons Why the Thermo-Dynamic® Does a Better Job of Trapping

1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

Maintenance Time: 40 Seconds. If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

For Prompt Information on the TD-50 . . . or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

Only SARCO makes all 5 types:

Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

*U.S. Pat. No. 2,817,353 TM Reg. U.S. Pat. Off. 1409

SARCO COMPANY, INC.

635 Madison Ave., New York 22, N. Y.

NEW CATALOG Describes Latest Developments in Waste and Refuse Storage and Removal

New Techniques Cut Cubic Yard Removal Costs to Record Low

This new 28-page color catalog describes remarkable new developments in waste control and disposal that have, within the last two years, obsoleted many systems now in use. Cubic yard handling costs have been reduced to a point where many firms and municipalities are saving thousands of dollars annually that they were previously spending to operate old-style equipment.

Materials handling and waste disposal are two of the few areas of large potential cost reduction remaining in manufacturing and municipal administration. This new catalog has a bearing on both of these areas of operation.

To get your copy of this new fact-filled catalog, write today.

DEMPSTER BROTHERS
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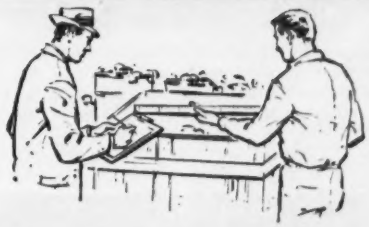

FREE SURVEY WITHOUT OBLIGATION
Dempster Field Engineers, located in all sections of the country, make thousands of cost-finding refuse storage and collection surveys every year, without cost or obligation. If you would like to know your disposal costs, and what—if any—avenues of improvement exist, write today on your letterhead.

28 Page Catalog **FREE**

Dempster Brothers, Dept. FE-5
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Please Send New Catalog Brief 160
Name_____
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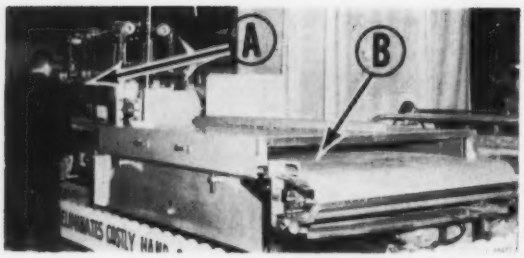
10 New Units to Aid Packers

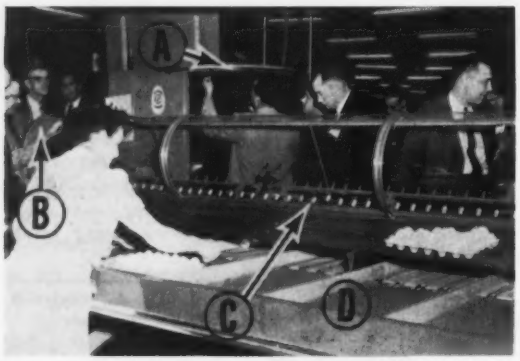
Sizer, pasteurizer, chiller, and deboner spotlighted as FE ranges camera on Kansas City poultry show displaying latest in processing and packaging equipment



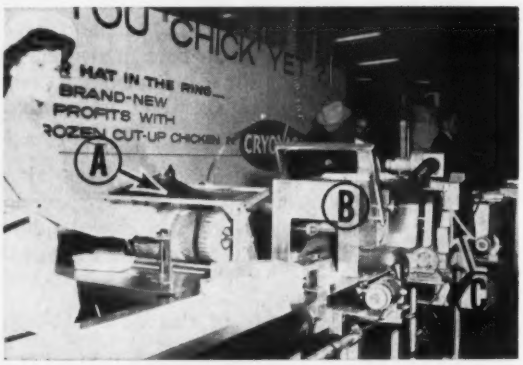
DEBONER automatically separates cooked meats at up to 1,500 birds/hr. Poultry first goes to hopper of feed elevator for distribution on harrassing unit (A) that loosens meat from bones. Separator-belt conveyor (B) uses stainless fingered "kickers" to deflect bone from meat.—Gordon Johnson Co., Kansas City, Mo. (345)

DUAL-TUBE giblet chiller employs direct and indirect system of cooling up to 10,000 lb./hr. with slush ice. Counterflow action of cold water chills and flushes discharged giblets.—Morris & Assoc., Inc., Raleigh, N. C. (346)

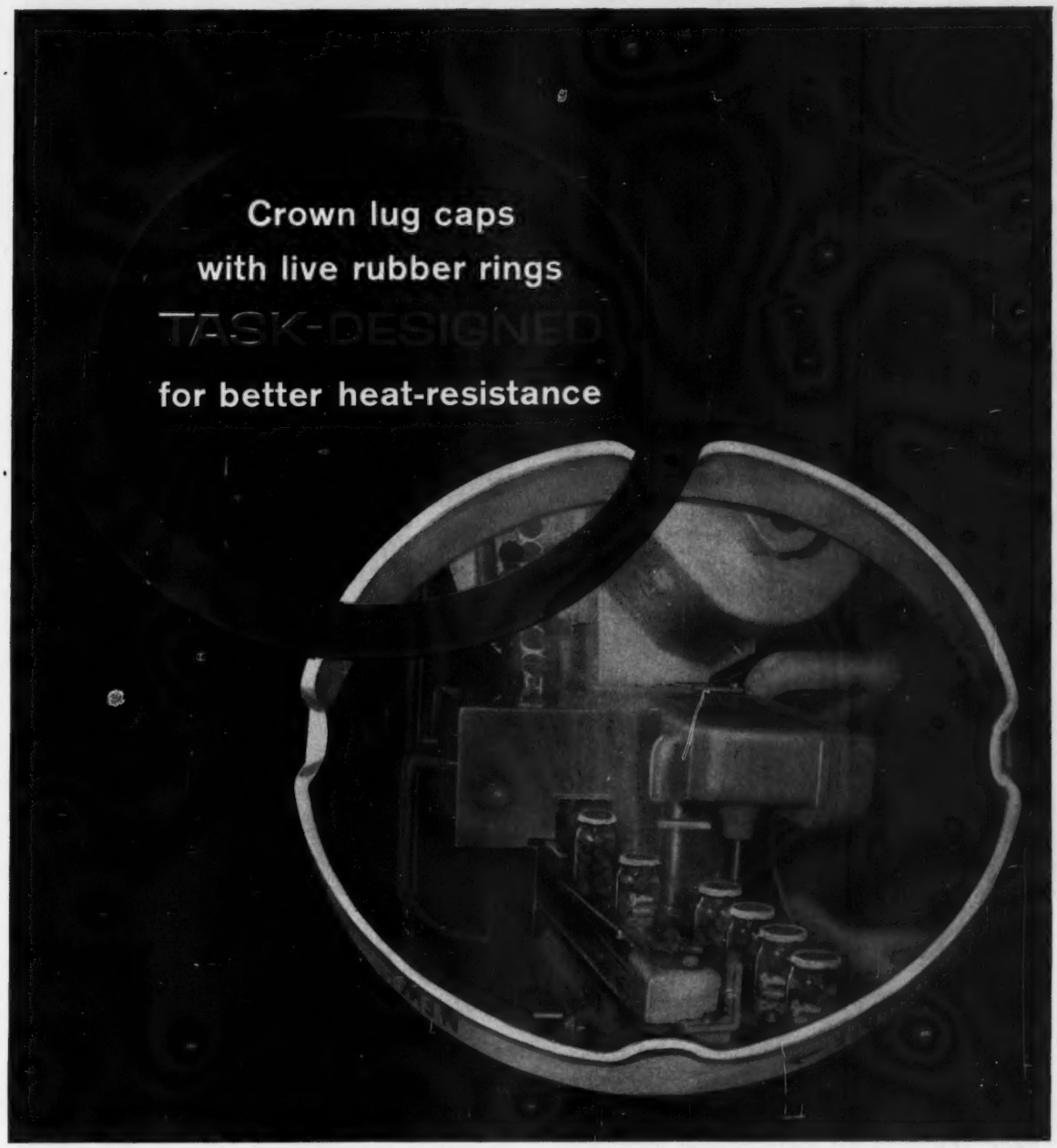
AIR-OPERATED poultry bag stuffer handles 10-15 birds/hr. using PVC bags that stretch and shrink without heat application. Bag is pliable at low temperatures, resists tearing and puncturing.—Visking Co., Chicago. (347)



NEW EGG GRADER sorts 6-8 sizes at speeds of 35 cases/hr. Unit comprises semi-automatic vacuum egg lift, multiple egg-candling booth (A), brand and grade coder (B), counterweighted scaling system (C), and packing table (D).—Libra Eirensorteermachines, Aalta, Netherlands. (348)

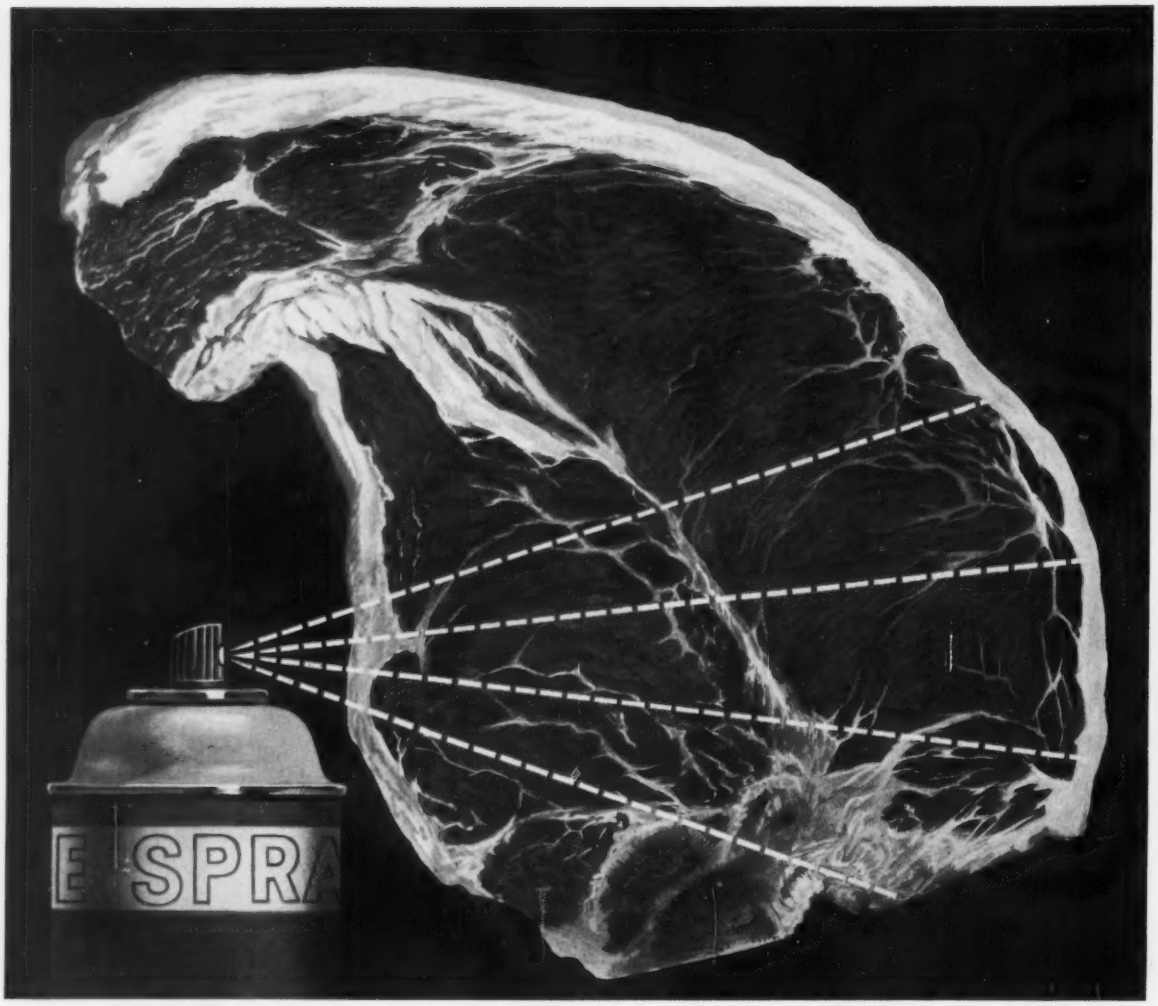


TRAY-PACKING LINE for cut-up poultry turns out 40 pkg./min. using 8 wrapping stations (A), sealer-cooler (B), and hot air-shrink tunnel (C). Unit employs shrinkable polyolefin film. System allows manufacturers to package more economically than at store level.—Cryovac Div., W. R. Grace & Co., Cambridge, Mass. (349)



Task-Designed Crown lug caps—with rings of live rubber, the only material that completely retains its sealing efficiency under vacuum capping and processing. They turn on easily and seal firmly, despite minor irregularities in the glass. Your product is thoroughly protected, from kettle to kitchen. Housewives prefer live rubber rings, too, because they don't soften and stick to the lip of the jar. Live rubber resists wear, so continues to seal efficiently no matter how often the cap is removed and replaced.

CROWN *for closures · cans · crowns · machinery*
CROWN CORK & SEAL CO., INC., 9300 Ashton Road, Philadelphia 36, Pa.



RHOZYME for tailored meat tenderizers

Here's your chance to get off to a good start in the new field of aerosol-packaged meat tenderizers . . . by using RHOZYME proteolytic enzymes, of microbiological origin. Unlike similar products derived from other sources, RHOZYME enzymes can be manufactured to a variety of specifications. They are adaptable to both liquid and powdered meat tenderizers. Basic formulations for both types are now available from our laboratories. The liquid tenderizers are "naturals" for packaging in spray dispensers . . . for convenient, logical, economical application. And since the use of aerosol cans in food marketing is a novelty, tenderizers sold in such containers should enjoy an excellent sales position on retail shelves.

The action of RHOZYME enzymes is also valuable in processing many other protein-containing materials. Examples include: modifying whey protein for cheese spreads; improving the baking characteristics of bread, crackers, cookies, pretzels; producing protein hydrolyzates for diet foods, breakfast cereals, pharmaceuticals; and converting protein wastes (e.g. fish solubles) to animal feeds. Write to Dept. SP-26 for useful suggestions on the use of these enzymes.

RHOZYME *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

Chemicals for Industry

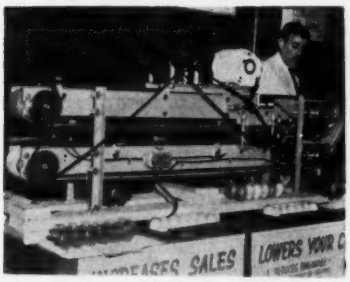
ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

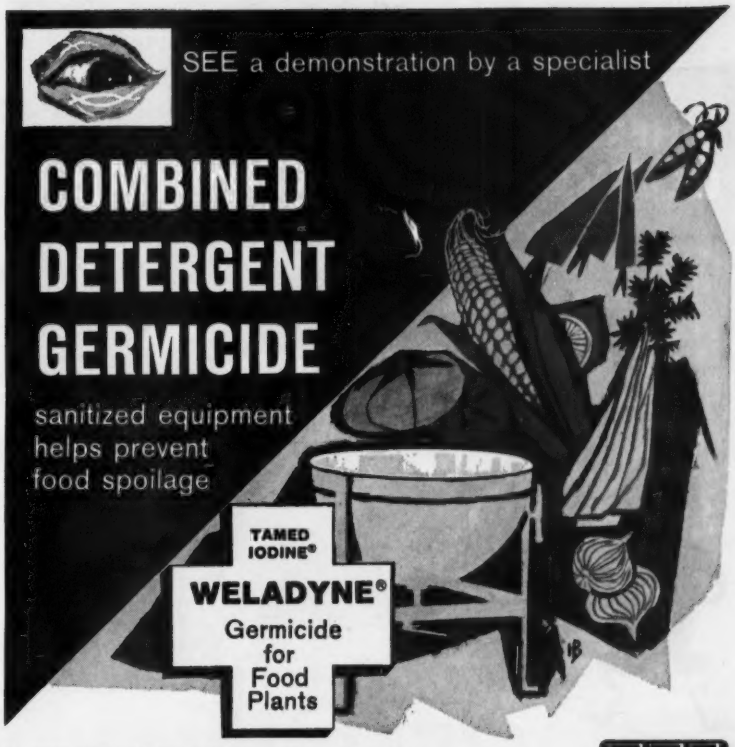
RHOZYME

CENTRIFUGE (1,300 rpm.) takes screw-conveyed shells from egg breaker-separator to recover 1¼ lb. technical albumin/case. Shells are hopper-fed through two drums, one operating at a 100 rpm. faster speed. —Seymour Foods, Inc., Topeka, Kan. (350)

CONTINUOUS EGG-PASTEURIZING process (high temperature) is a 3-stage unit (one stage not shown), consisting of two vacuum deaerators and a controlled steam heater for checking growth of salmonella, coliform, and other bacteria. System takes 144F. liquid eggs from plate-type heat-exchanger.—The Creamery Package Mfg. Co., Chicago. (351)



EGG CARTON SEALER handles new plastic packages at rate of 2,500/hr. Carton consists of transparent acetate top cover (vacuum-formed) and high-impact polystyrene blue bottom. Cover can be printed at both ends according to brand, grade, and supplier.—Kingston Products Corp., Kokomo, Ind. (352)



for FREE demonstration or literature address:
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CIRCLE 232 ON READER SERVICE CARD

NIAGARA "no frost"

BEST COLD-CONTROL and the LOWEST COST

● You can have 20′ head room and hold below 0° storage space. Niagara's "NO-FROST" method gives you a constant, even safe temperature in every foot of height with plenty of head room to stack your goods and use your fork lift trucks efficiently. You don't have to let ineffective refrigeration force you into bad lay-out. Your storage, break-up and order assembly areas can be just as you want them. Insist that your new building design lets you handle frozen food as fast as dry groceries. You can get it with Niagara "NO-FROST" plus lowest upkeep expense in the business.

Write for Bulletin No. 105

NIAGARA BLOWER COMPANY
Dept. FE-5, 405 Lexington Ave., New York 17, N. Y.
District Engineers in Principal Cities

CIRCLE 123 ON READER SERVICE CARD

HERE'S A BETTER WAY TO . . .
CONVEY LIGHT PRODUCTS!

Freshly packaged cheese sections emerge from automatic packaging machine and are conveyed smoothly and quickly to labelling machine—products received no handling—remain fresh and clean.

WITH WENDWAY

Wendway is ideal for conveying fresh-unwrapped meat. Stainless steel belting is recommended.

Cartons or packages ride perfectly on Wendway's smooth, silent belting.

Wendway is the most versatile conveyor in Industry today. With Wendway, you can eliminate the multiple handling of products, save man hours and floor space. You can have remote-controlled efficiency in conveying any light products to any point in your plant. Wendway turns corners, goes up-down in single or multiple tiers—and Wendway's steel wire belting is ideal for handling *anything* up to approximately twenty pounds per package.

Then too—Wendway does not sag or accumulate oils or dirt like *ordinary* belting. It can be kept highly sanitary—easily.

But best of all—Wendway will pay for itself in actual savings.

If you have a light package conveying problem—why not use the coupon below or write today for full details on this versatile conveying system.

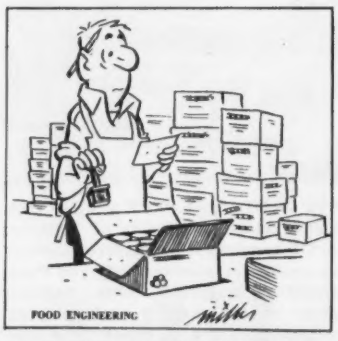
USP

Gentlemen:
Please send me additional information about Wendway for conveying_____.
Name_____
Company_____
Address_____Zone____State_____
Have a USP Conveyor Engineer contact me at once ☐

UNION STEEL PRODUCTS COMPANY
ALBION, MICHIGAN

COMBINATION SYSTEM sizes and drains birds between chilling and packing operations. Unit ends transfer handling, permits wing-tagging and on-the-line giblet stuffing. When bird reaches designated size, mercury switch is closed by scale-balance beam to energize carrier's solenoid, releasing bird into cooling vat.—W. F. Altenpohl, Inc., Philadelphia. (353)

MOISTURE-RESISTANT corrugated boxes are wax-treated to retain strength even when dripping wet. They're designed for packing top-iced poultry.—Hinde & Dauch, Sandusky, Ohio. (354)



"To re-order, just call FUji 5-2963, Sukijama, Japan."

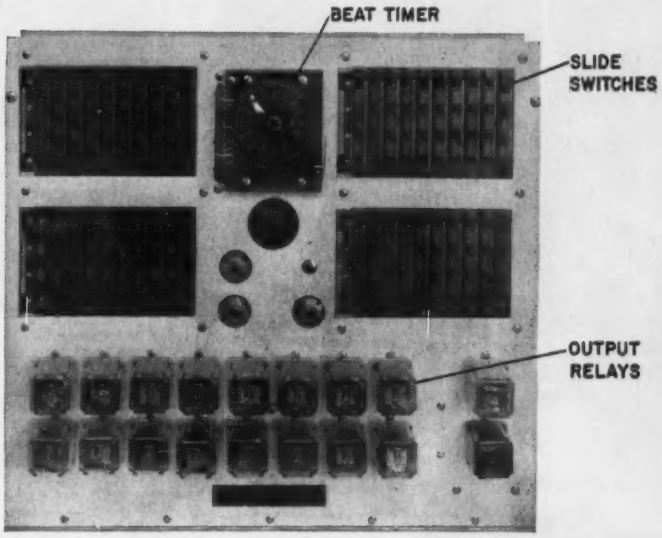
New from Taylor for CIP Systems

VALVE PULSING CONTROL PANEL

Insures effective cleaning of CIP Product Handling Valves and associated piping and processing equipment programming the cycling of the CIP Valves. Actuated by the timer on the CIP recirculation system, one Control Panel can program up to four completely independent circuits.

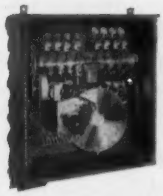
The Valve Pulsing Control Panel is simple, dependable, and highly adaptable. Programs can be varied without wiring changes. Step switch and relays plug in. Relays contain indicator lights. A jog switch permits simple checking of relays, external solenoid valves and CIP valves.

The panel is expandable—relays, 2 or 3 pole, can be added as plant needs change. All units include 16 relay sockets and wiring. It can be mounted in rear of a control panel, or in dust-tight control box.



You also need these basic instruments...

Taylor Valve Actuators to operate your Cleaned-In-Place Product Handling Valves. Three standard types.



FLEX-O-TIMER* Timed Program Controller to provide for direct time settings of operation sequence through pneumatic and/or electric actuation.

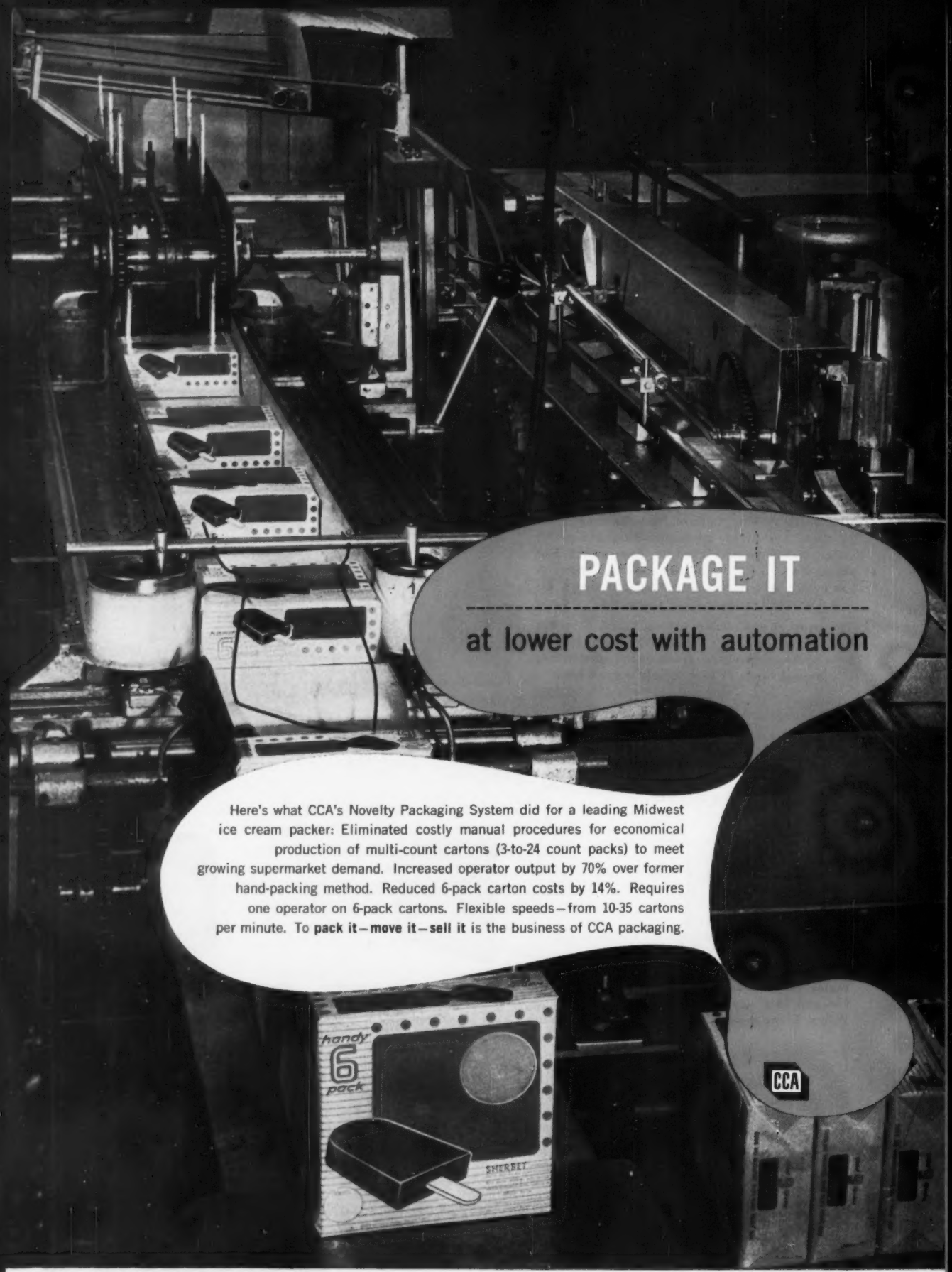
Taylor FULSCOPE* Controller to insure precise control of circulated solution temperature at any desired value.

If the engineering for your CIP System has been completed, your Taylor Field Engineer will be glad to specify the required instrumentation. If not, contact your preferred equipment supplier or source of cleaning chemicals... and be sure to specify "Taylor equipped as usual".

Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ont.

*Reg. U.S. Pat. Off.

Taylor Instruments MEAN ACCURACY FIRST


PACKAGE IT
at lower cost with automation
Here's what CCA's Novelty Packaging System did for a leading Midwest ice cream packer: Eliminated costly manual procedures for economical production of multi-count cartons (3-to-24 count packs) to meet growing supermarket demand. Increased operator output by 70% over former hand-packing method. Reduced 6-pack carton costs by 14%. Requires one operator on 6-pack cartons. Flexible speeds—from 10-35 cartons per minute. To **pack it—move it—sell it** is the business of CCA packaging.
handy
6
pack
SHERBET
CCA

CONTAINER CORPORATION OF AMERICA, Chicago 3 . . . and all key marketing areas. Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products

Additives Carried Over

Polytetrafluoroethylene, Silicones (not less than 300 centistokes), Stearic acid amide, and Waxes, microcrystalline and paraffin, complying with Type I and II specifications.

(26) Pigments and colorants: Aluminum, Aluminum hydrate, Aluminum and potassium silicate (mica), Aluminum mono-, di-, tristearate, Aluminum silicate (china clay), Barium sulfate, Bentonite, Bentonite, organic-base modified, Burnt umber, Calcium carbonate, Calcium silicate, Calcium sulfate, Carbon black ("cannel" process), Iron oxides, Magnesium oxide, Magnesium silicate (talc), Raw sienna, Silica, Tartrazine lake (certified FDC Yellow No. 5 only), Titanium dioxide, Titanium dioxide-barium sulfate (approximately 70%-30% ratio), Titanium dioxide-calcium sulfate (approximately 70%-30% ratio), Titanium dioxide-magnesium silicate (approximately 70%-30% ratio), and Zinc oxide.

(27) Miscellaneous materials: Ammonium citrate, Ammonium potassium phosphate, Calcium acetate, Calcium ethyl acetoacetate, Calcium glycerophosphate, Calcium, sodium, and potassium oleates, Calcium, sodium, and potassium ricinoleates, Calcium, sodium, and potassium stearates, Disodium hydrogen phosphate, Lecithin (edible grade), Magnesium, sodium, and potassium citrates, Magnesium glycerophosphate, Magnesium stearate, Mono-dibutyl amine pyrophosphate, Mono-, di-, and tricalcium phosphate, Mono-, di-, and trimagnesium phosphate, Phosphoric acid, Sodium pyrophosphate, Sodium tetrapyrophosphate, and Tin stearate.

(28) Surface lubricants: Cottonseed oil and other edible oils, Dibutyl sebacate, Dioctyl sebacate, Glyceryl monostearate, Palm oil, Paraffin wax complying with type specifications, Petrolatum, stearic acid, and White (mineral) oil.

Those That Missed: FDA here calls attention to 8 additives omitted from the above time-extension listing, pending "evaluation of additional data that will specifically identify the particular substances for which the extensions are requested." These are:

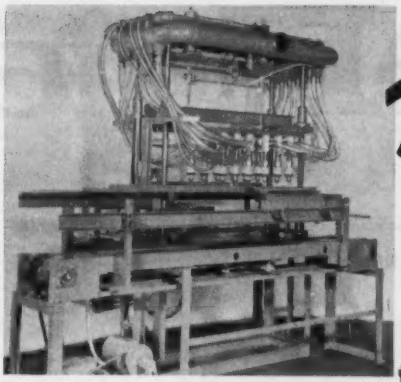
Maleic acid adducts, bisphenol-epichlorohydrin combined with allyl ether of mixed methylol phenols, bisphenol-epichlorohydrin combined with reactive polyamides, mixed acrylates, chlorinated rubber, diethylene glycol, ethylene glycol, and silicones (not less than 300 centistokes viscosity).

List 2 More Pesticides

The month saw time extensions granted to two more pesticidal chemicals used in or on raw agricultural food commodities.

These are *p*-Chlorophenoxy acetic acid (listed for use on bean seeds in sprout production, to eliminate embryonic root development, and on tomato blossoms to enhance fruit set), and Isopropyl ester of 2,4-dichlorophenoxy acetic acid (listed for use on potatoes for better skin set and to enhance color).

Thirteen food pesticides had earlier been given additional time (see FE Apr., p. 101).



EXPECT BETTER PERFORMANCE FROM

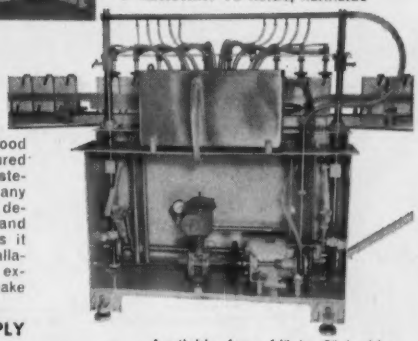
Mayon

Pure vinyl food TUBING

- NON-TOXIC, ODORLESS, TASTELESS
- STERILIZABLE, NON-OXIDIZING
- CRYSTAL CLEAR, FLEXIBLE
- RESISTANT TO ACIDS, ALKALIES

HIGHLY PERFECTED FOR SOFT DRINK AND LIQUID FOOD DISPENSING MACHINES

When you specify MAYON pure vinyl food tubing in any installation, you are assured of the utmost in quality . . . odorless, tasteless, non-toxic, and highly resistant to any acid or alkali action; even the strongest detergents. The high degree of flexibility and toughness of this finer tubing makes it particularly adaptable to intricate installations. The glass-smooth interior and exterior surfaces resist abrasion and make cleaning easy.



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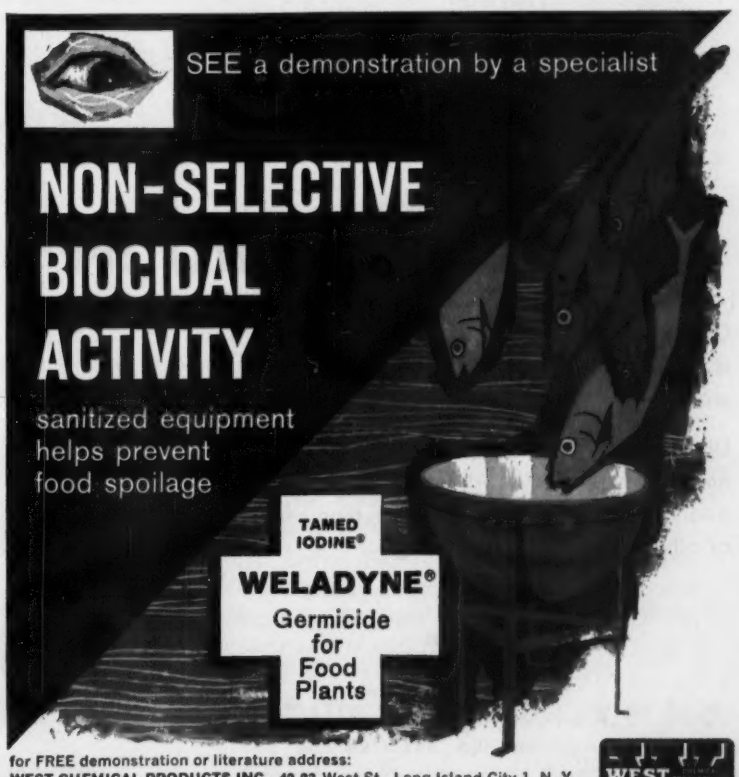
Available from ⅛" to 2" inside diameter. Continuous lengths up to 100 feet. Available with stainless steel braid for high pressure applications. All ingredients sanctioned by Food & Drug Administration.

CIRCLE 233 ON READER SERVICE CARD



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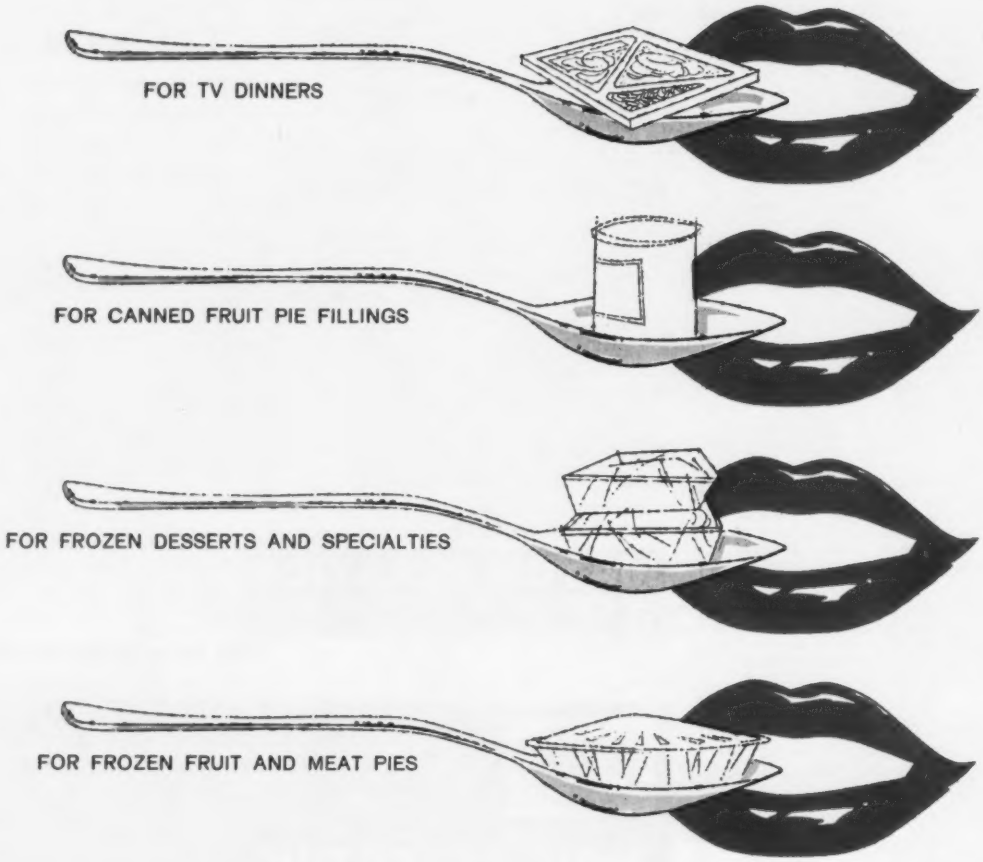
WEST CHEMICAL PRODUCTS INC., 42-23 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

WEST

←CIRCLE 126 ON READER SERVICE CARD

CIRCLE 127 ON READER SERVICE CARD

Col-Flo 67



NEW STANDARD IN STABILIZERS

COL-FLO 67—canned or frozen—never imparts an undertone of cereal taste. Never interferes with natural food flavors.

UNMATCHED STABILITY. Col-Flo 67 safeguards and improves stability. All tests show far greater resistance to freeze-thaw breakdown than wheat flour or other waxy starches.

EXCELLENT CLARITY. Col-Flo 67 doesn't cloud natural colors between processing and eating. An appealing crystal clear glossiness highlights your food product.

A simple taste comparison quickly emphasizes the advantages of tasteless Col-Flo 67. Write for details, telling us something of the use you have in mind.

National STARCHES

NATIONAL STARCH and CHEMICAL CORPORATION

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JUST OFF THE PRESS

PLANT ENGINEERING

Panel Coils. Details models for heating and cooling. 2p. —Dean Products, Inc., Brooklyn, N. Y. (418)

CO_2 Maker. Illustrated automatic, packaged system. 6p. —Louis DeMarkus Corp., Buffalo, N. Y. (419)

Wire Cloth. Revised catalog describes line of cloth, belts, fabrications. 102p. — Cambridge Wire Cloth Co., Cambridge, Md. (420)

Butterfly Valves. Describes resilient seated type for positive closures. 4p.—W. S. Rockwell Co., Fairfield, Conn. (421)

Plastic Stock Shapes. Gives data on mill shapes of nylons, TFE flurocarbons, polycarbonates, etc. 12p.—Polymer Corp., Reading, Pa. (422)

Pump Motors. Details close-coupled, 1-hp. and larger units in 3500 or 1750 rpm. 4p.—Wagner Electric Corp., St. Louis. (423)

Gaskets. Illustrates and describes line for flanges, joints, furnace doors, etc. 12p.—Greene, Tweed & Co., North Wales, Pa. (424)

Strainer Guide. Comprehensive handbook gives data for layout of fluid flow systems and sizing, testing results, valve and pipe selection. 100p. — Tate Engineering, Inc., Baltimore. (425)

Corrosion Resistant Valve. Lists effects of 390 fluids on metals, plastics, synthetic rubbers used in firm's valve. 8p.—Hydromatics, Inc., Livingston, N. J. (426)

Magnetic Pulleys. Explains selection and application of electromagnetic or non-electric ceramic types. 8p.—Dings Magnetic Separator Co., Milwaukee. (427)

Decimal Equivalent Chart. Handy wallet-sized reference. — Tube Distributors Co., Garden City, N. Y. (428)

PROCESSING

Centrifuges. Details new line of de-sludgers for continuous removal of solids from suspensions and slurries.—De Laval Separator Co., Poughkeepsie, N. Y. (429)

Screeners. Application data and comparative opening reference tables for silk, nylon, and wire cloth. 32p.—Orville Simpson Co., Cincinnati. (430)

Vibrating Feeders. Details line of machines for wide range of bulk materials. 12p. —Link-Belt Co., Chicago. (431)

Spray Drying. Describes research, engineering, testing, and custom drying facilities available. 4p.—Nerco-Niro Spray Dryer Labs, Netcong, N. J. (432)

Electric Eyes. Details use of miniature eyes for sorting, counting, inspecting, level control, etc.—Photomation, Inc., Bergenfield, N. J. (433)

Corn Cutter. Illustrates and describes unit for increased production and better grades. 6p.—United Co., Westminster, Md. (434)

PACKAGING

Container Feeder. Gives specs of automatic sorter and feeder for plastics. 2p.—

FOR NEW ANGLES IN PROCESSING

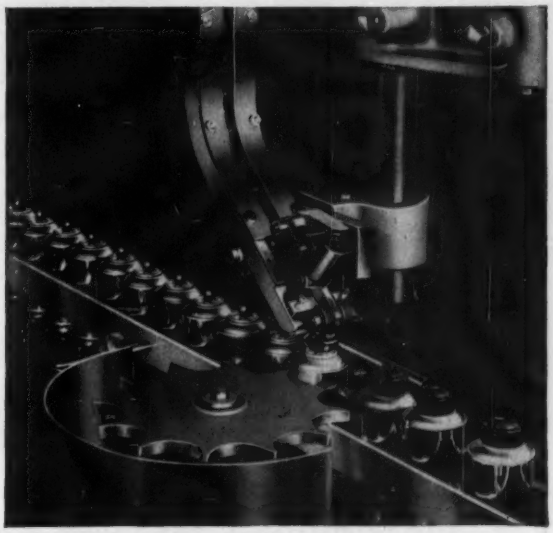
This close tolerance continuous mixer represents a major refinement in processing machinery. It is specifically designed for continuous flow operation. Inner members are stainless and it is equipped with heating or cooling jacket. We will be pleased to consider your handling problems. *Write for free brochure.*

ANTHONY

WILLIAM A. ANTHONY ENGINEERING COMPANY
9716 Madison Ave., Cleveland 2, Ohio

CIRCLE 234 ON READER SERVICE CARD

The Cap Fits 300 times a minute!



Closeup view of new Sorter Chute and Chute Escapement on H-O-F Capper. It rolls snap-on caps (up to 300 a minute) with perfect fit.

Now you can average up to 300 perfectly snug metal or plastic closures a minute with the Consolidated H-O-F Capper. That means extra profits—quickly!

An important feature is the escapement mechanism. It automatically holds back your fitment supply and rolls each fitment on carefully and exactly. No container, no cap device.

The H-O-F Capper complete with chute escapement, is equally fast and efficient with *aerosol* containers, odd or conventionally shaped over-caps. Also adaptable for ointment and shoe polish cans and other types of slip-fit closures. Easy changeover from one size container to another.

Ask our packaging specialists for complete information about the H-O-F Capper and the H-O-FV Valve Applicator for the drug, cosmetic and aerosol fields.
Write sales manager:

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1400 WEST AVE., BUFFALO 13, N. Y.
A Subsidiary of International Paper Company

CIRCLE 129 ON READER SERVICE CARD

Pneumatic Scale Corp., Ltd., Quincy, Mass. (435)

Gluing System. Describes method for case gluers and sealers. 4p.—Emhart Mfg. Co., Portland, Conn. (436)

Labeler. Gives specs and applications for use with polyethylene packages. 2p. —Amsco Pkg. Machinery, Inc., Long Island City, N.Y. (437)

Coder. Describes machine for marking flat or concave-bottomed bottles and cans. —JCL Engineering Co., Los Angeles. (438)

Case Handling. Five bulletins detail line of uncasing, sorting, and packing equipment. 32p.—Atkron, Inc., Cuyahoga Falls, Ohio. (439)

Heat Sealing. Matches problems with solutions of sealing polyethylene film. 2p.— U.S. Industrial Chemicals Co., N.Y.C. (440)

Can Filler. Describes features and applications of automatic unit. 4p.—B. F. Gump Co., Chicago. (441)

Cartoning. Details equipment for handling Maralok cartons. 4p.—Marathan Div., American Can Co., Menasha, Wis (442)

Multipack Carrier. Describes new plastic band-and-handle carton for multipackaging of beer, soft drinks, etc. 12p.— Illinois Tool Works, Des Plaines, Ill. (443)

MATERIALS HANDLING

Reach Truck. Specs and features of narrow-aisle model. 6p.—Clark Equipment Co., Battle Creek, Mich. (444)

Bottle Uncasers. Checklist points up features of firm's unit. 1p.—Lodge & Shipley Co., Cincinnati. (445)

Polyester-Vinyl Conveyor Belting. Gives features and specs of new Permagloss industrial belting. 4p.—Lassiter Corp., N.Y.C. (446)

Truck Loader. Details powered elevating tailgate for 1½ ton and larger trucks and trailers. 2p.—H. S. Watson Co., Emeryville, Calif. (447)

Lift Trucks. Highlights line of handling epuipment. 4p.— The Yale & Towne Mfg. Co, Philadelphia. (448)

Drum Arms. Describes automatic handling arms for mounting on forks or aprons of lift trucks.—Little Giant Products, Peoria, Ill. (449)

Conveyor Systems. Details features and specs of firm's Handidrive line. 22p.—Standard Conveyor Co., N. St. Paul, Minn. (450)

Jetslingers. Describes machine for loading and storing bulk materials in difficult areas. 6p.—Link-Belt Co., Chicago. (451)

Tote System. Reprint details money-saving method used for sugar handling in biscuit plant. 4p.—Tote System, Inc., Beatrice, Neb. (452)

Dump Boxes, Carts, Tilts, Racks, Etc. Describes extensive line of firm's handling equipment. 14p. — Palmer-Shile Co., Detroit. (453)

SANITATION & MAINTENANCE

Ultrasonic Cleaning. Describes features of new system including generators, transducers, chemicals. 24p. —Branson Ultrasonic Corp., Stamford, Conn. (454)

Dust Control. Details system of statically bombarding particles for ionization. 6p.— CRS Industries, Philadelphia. (455)

Sewage Concentrator. Details Roto-Plug unit for dewatering sludges without use of chemicals. 4p.— Nichols Engr. & Research Corp., N.Y.C. (456)

Polyethylene Tubing. Describes tough, light-weight, flexible tubing for lab. 1p. —Parker-Hannifin Corp., Cleveland. (457)

Plant & Tank Cleaner. Details firm's line of equipment. 4p—Sellers Injector Corp., Philadelphia, Pa. (458)

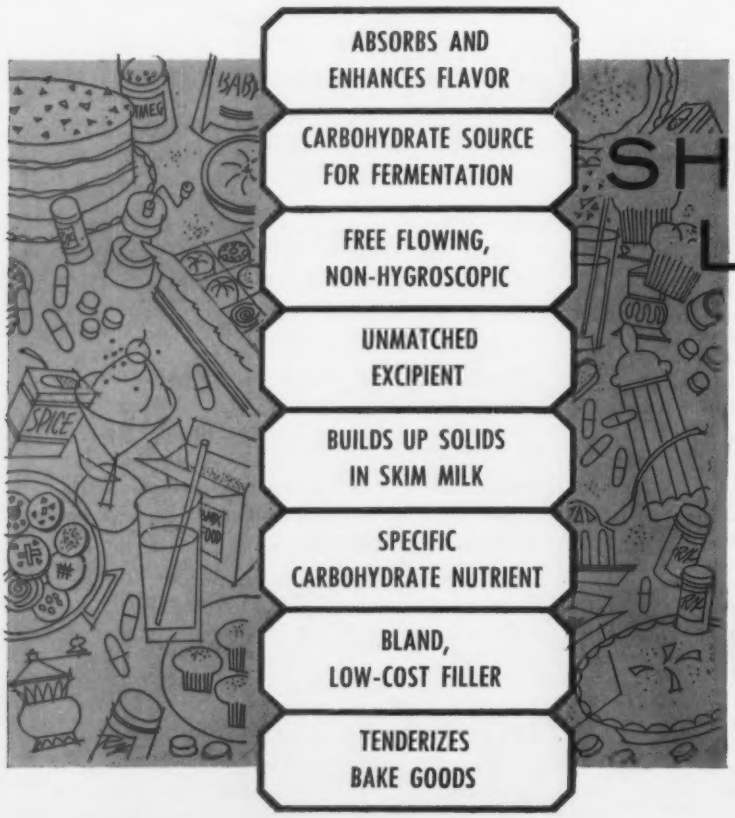
Custodial Closet. Data sheet suggests construction and layout for proper lighting, ventilation, etc.—Puritan Chemical Co., Atlanta. (459)

Ultrasonic Cleaning. Describes principles and uses of wave motion system. 4p. — Oakite Products, Inc., NYC. (460)

Floor Topping. Details features of new "Duratrem" flooring. 2p.—Tremco Mfg. Co., Cleveland. (461)

Steel Drum Care. Discusses cleaning, use, and design of stainless steel shipping and process containers. 12p.— Inland Steel Container Co., Chicago. (462)

Coatings. Details systems



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And the best way to prove it is to try it now in your own applications!

The uses for this highly versatile milk sugar are expanding every day. Sheffield LACTOSE is available in a variety of granulations to suit your needs. Contact us today. Write Dept. FE-560.

SHEFFIELD CHEMICAL
Norwich, N. Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

Baker William Wilson checks the biscuits near the exit of the USS Cyclone Conveyor Belt.

"We've eliminated downtime completely with a USS Cyclone Conveyor Belt'

"Since we installed a USS Cyclone Steel Conveyor Belt in our direct-fired biscuit oven, we've had a record of 100% production *every day*," says Mr. William C. Warner, President, Warner Dog Food Company, Inc., Brooklyn, New York. "But it was a different story with the old-fashioned belt we *used* to use. Because the oven bakes approximately one ton of biscuit dough an hour, we suffered a substantial loss every time it was shut down for repairs. The repairs couldn't even start until the oven had cooled for a full hour and was no longer dangerous to touch.

"Production during these downtime periods was lost forever, because once the repairs were completed, the oven couldn't be speeded up. The cycle time had to remain constant to insure thorough baking and uniform consistency. On many occasions, even a minor repair job meant no more production for the day, because the time and expense involved in reheating the oven weren't justified if a major part of the day was over.

"These frequent troubles convinced us we should switch to a USS Cyclone Conveyor Belt. We placed our order, and the belt was delivered as scheduled, with no delays or excuses. And we're entirely satisfied with its performance. The belt has required no service or maintenance whatsoever. We certainly wouldn't hesitate to recommend it to others."

Wasted man-hours—no matter what the cause—can be a headache in *any* plant. Wouldn't *your* plant profit from an increase in daily production? A USS Cyclone Conveyor Belt system can help you do it. The Cyclone line is the most complete line of metal conveyor belts offered by any belt manufacturer. Find out which one is right for *your* product—just send for our free booklet.

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Division of
United States Steel

Cyclone sales offices coast to coast

American Steel & Wire
Dept. 0232, 614 Superior Ave., N.W.
Cleveland 13, Ohio

Please send me your free booklet on USS Cyclone Conveyor Belts.

Name_____

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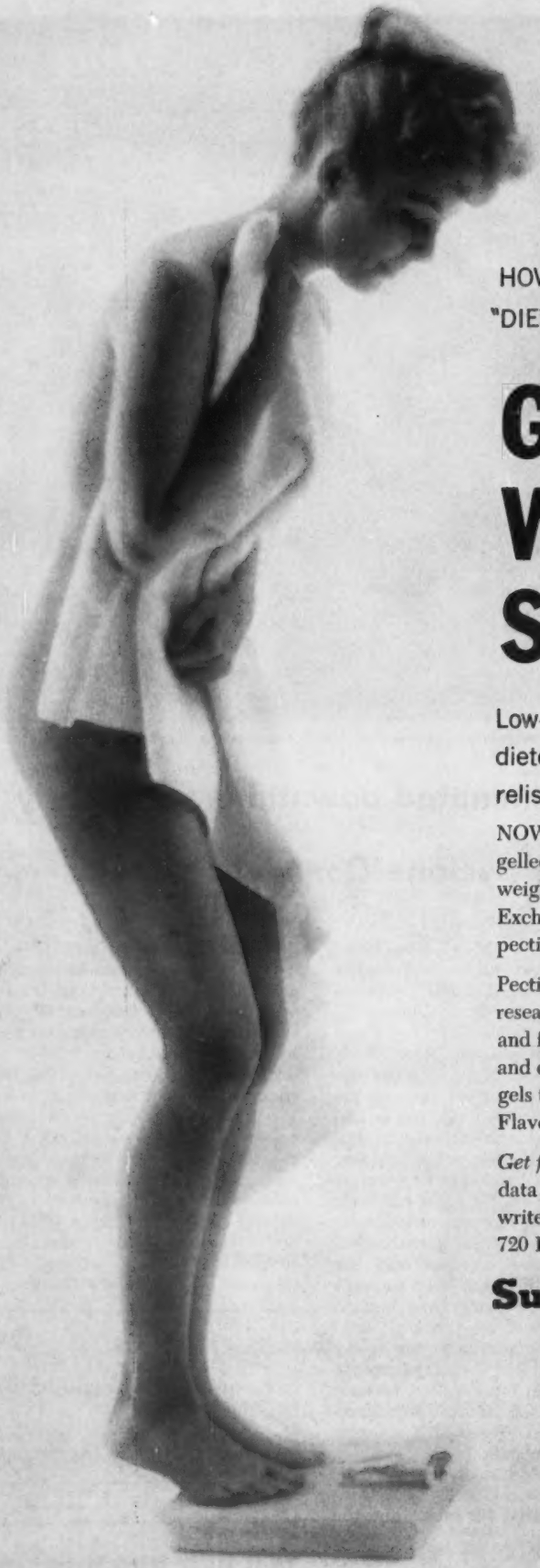
City_____

Zone_____ State_____



HOW TO LEAD THE
"DIETETIC FOODS" PARADE

GELS WITHOUT SUGAR

Low-calorie jams...
dietetic fruit jells...aspics...
relishes...sauces...desserts...

NOW you can make delicious sugar-free gelled foods that even the most conscientious weight-watcher or diabetic can enjoy—with Exchange Low Methoxyl Pectin...the only pectin that forms a true gel without sugar.

Pectin L.M.—an exclusive Sunkist citrus research development—improves appearance and flavor, too. It gives sparkling brilliance and desirable tenderness and elasticity to gels that remain firm at room temperature. Flavorless, it does not absorb or adsorb flavor.

Get full information—including technical data and formulas. Call your Sunkist man or write Sunkist Growers, Products Sales Dept., 720 East Sunkist Street, Ontario, Calif.

Sunkist Growers

Exchange

and matches them with specific problems. Contains corrosion meter test results. 18p. — The Glidden Co., Cleveland. (463)

Dust Collector. Describes "Pulsaire" system for recovery of nuisance and high value dusts. 10p.—Mikro-Products, Summit, N.J. (464)

Insulations. Gives specs of spun mineral wool, calcium silicate, 85% magnesia product block, blanket, fill, cement, and pipe forms. 24p.—Baldwin - Ehret - Hill, Inc., Trenton, N.J. (465)

INGREDIENTS

Price List. Wholesale prices of oils, chemicals, absolutes, concretes, fixatives, tinctures, etc. 12p.—Fritzche Brothers, N.Y.C. (466)

Brewers Yeast. Describes autolyzed material for fermentation media components and chemical intermediates. 4p.—Amber Labs, Inc., Milwaukee. (467)

Sorbic Preservative. Details features and applications of sorbic and potassium sorbate (water-soluble fungistat). 18p.—Union Carbide Chemicals Co., N.Y.C. (468)

Acronize Chlortetracycline. Features of antibiotic for halting bacterial growth in perishable foods. 24p.—American Cyanimid Co., N.Y.C. (469)

INSTRUMENTS

Thermometers. Details air duct, multiform, and moisture proof models. 4p.—Precision Thermometer & Instrument Co., Philadelphia. (470)

Level Indicators, for automatic control of pulverized, fine, crushed, or granular material. 8p.—Fuller Co., Catasauqua, Pa. (471)

Viewing Equipment. Describes inspection glass for ovens, dryers, etc.—R. H. Wager Co., S. Orange, N. J. (472)

Counting Scales. Illustrates models for shipping, production, stock control, etc.—Detecto Scales, Brooklyn, N. Y. (473)

Liquid Control. Describes refractometer for measuring organic and inorganic streams. 2p.—Mine Safety Appliances Co., Pittsburgh. (474)

Recorder Timers. Gives specs for full line of clocks. 4p.—Lux Mfg. Co., Waterbury, Conn. 475)

Temperature Controller. Details pneumatically operated unit for remotely readjusted temperatures. 10p.—Powers Regulator Co., Skokie, Ill. (476)

Differential Gage. Details unit for measuring small pressures at relatively high line pressures. 2p.—Wallace & Tiernan, Belleville, N. J. (477)

Sensing Control. Details electronic unit for detecting, counting, and measuring grain, flour, etc. 2p.—Security Controls, Inc., Buffalo, N. Y. (478)

Recorders & Controllers. Describes units for pH and redox. 2p.—Leeds & Northrup Co., Philadelphia. (479)

QUALITY CONTROL

Electrodes. Gives specs for line of type pH and Redox electrodes and mountings. 4p.—Leeds & Northrup Co., Philadelphia. (480)

Chromatography Catalog. Illustrates and describes over 300 items of apparatus and supplies. 28p.—Schaar & Co., Chicago. (481)

Gas Chromatography. "Research Notes" features studies of amines, paraffin wax, citrus oils, blood alcohol, etc. 8p. — Wilkens Instrument Co., Walnut Creek, Calif. (482)

Ovens. Catalog details regulated-temperature cabinets. 2p — Modern Laboratory Equipment Co., N.Y.C. (483)

Balance. Gives features of new vacuum, semi-micro, automatic-recording model. 4p. — Wm. Ainsworth & Sons, Inc., Denver. (484)

Radiochemicals. Catalog gives data on compounds, sources, standards, and source kits, also prices. 24p. — Nuclear-Chicago Corp., Des Plaines, Ill. (485)

MARKETING

Salesmen in the Sixties. Defines responsibilities, resulting from changes in buying policies and distribution. 4p. —Grey Advertising Agency, Inc., N.Y.C. (486)

Industrial Market Place. Illustrates relationship of one state to another in terms of value added by manufacture.

You can't tell me there's anything really different about

King Sharp Freeze Systems

Many a buyer has taken this attitude in our first meeting. We like to give him these facts . . . then he can decide for himself:

1. King Systems are guaranteed to perform to their ratings.
2. Our customers report lower operating costs on King units alongside of other makes in the same plants.
3. King Systems feature fast, economical air defrost.
4. King units can be serviced while warm, during defrosting. Maintenance is clean, comfortable, simple.
5. All installations are individually engineered by competent specialists.
6. Air circulation maintains even temperatures and air turbulence throughout room, free of blasts on box men, providing fastest possible freezing.
7. King Co. has a 50 year reputation of service and guarantee of performance to its thousands of customers.

Wouldn't you like to talk to the people that really know their business.

Write for free technical bulletin.

SHARP FREEZE SYSTEMS

King COMPANY OF OWATONNA

905 NORTH CEDAR STREET
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4p.—Russell T. Gray, Inc., Chicago. (487)

Today's Market. Considers population, employment, income, and spending trends as we enter '60's. 24p.—Macfadden Publications, N.Y.C. (488)

Tomorrow's Canadian Customers. Discusses population growth in expanding market. 4p. — Bank of Montreal, N.Y.C. (489)

Market Research & Policy Decisions. Points up importance of MR in making correct decisions.—Ford, Bacon & Davis, N.Y.C. (490)

The "New" Look. Discusses makeup of tomorrow's consumer. 4p.—Public Relations Board, Chicago. (491)

MANAGEMENT

Research. Presents case histories of successful research action and product development. 32p.—A. O. Smith Corp., Milwaukee. (492)

Auto Fleet Leasing. Discusses advantages and disadvantages, comparing company ownership, salesman ownership, and leasing. 28p. —Foundation for Management Research, Chicago. (493)

Equipment Leasing Plan. Explains program of leasing non-expendable equipment and fixtures. 6p.—U.S. Leasing Corp., San Francisco. (494)

Business Computing. Application of slide rules to business problems. 12p.—W. H. Pusch Computer Development, Pt. Lavaca, Tex. (495)

Steel Products and Services. Lists line of products, trademarks, and sales offices. 20p. —U.S. Steel Corp., Pittsburgh. (496)

Refrigerated Warehouses. Describes features of aluminum, hermetically-sealed buildings. 16p.—Refrigeration Engineering Co., Montgomery, Minn. (497)

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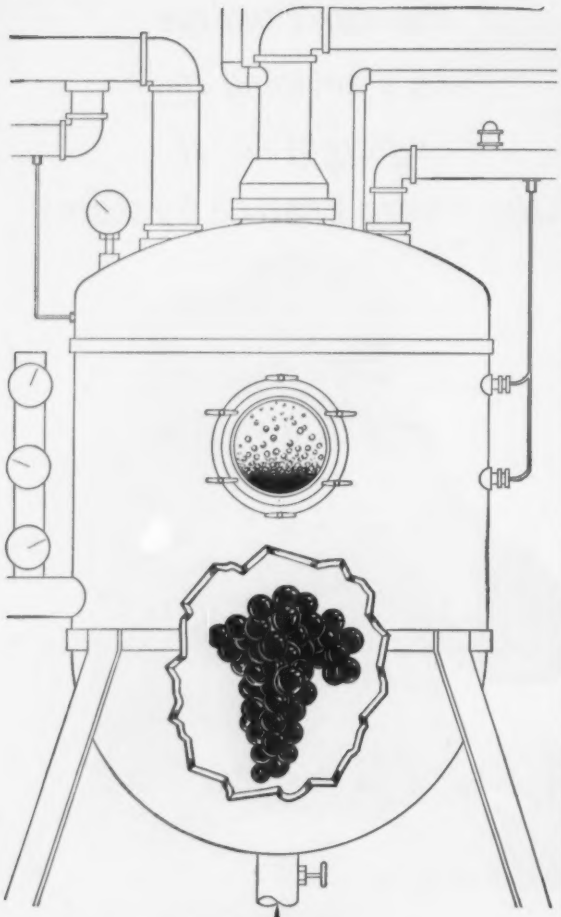
Any of these very latest catalogs, bulletins, or folders will be sped to you gratis. Just note here then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard — back of book. Then sign your name and address and mail.



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You can improve your product amazingly—by use of FLAVOREX *real fruit flavors*. Our "Low Temp" process coaxes out and captures the very last drop of goodness in the natural fruit. Those delicately elusive, but important, volatiles now are collected and entrapped in our real fruit concentrates . . . so that all the full, rich, good taste goes directly into your product. Available—black raspberry, black cherry, grape, strawberry, blackberry, punch, lemon and orange—as real fruit pure concentrated juices. Or with other natural flavors for added strength. Write for samples and prices today.

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CIRCLE 134 ON READER SERVICE CARD

du Verre

CONSTRUCTION GIVES COMPLETE CORROSION CONTROL . . .

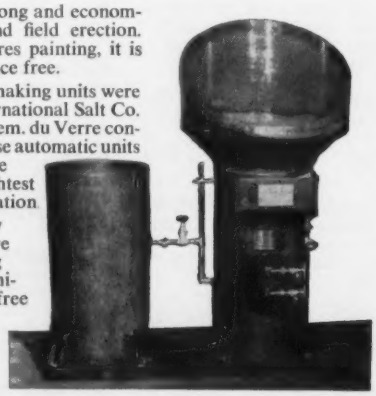
and contamination-free products

Why risk product contamination when du Verre fabricated Ducts, Hoods, Tanks and Open Vessels are completely inert to virtually all food products. Unlike coatings or linings, du Verre resin bonded Fiberglass is homogeneous in structure giving protection inside and out!

du Verre is light, strong and economical in first cost and field erection. Since it never requires painting, it is clean and maintenance free.

These special brine making units were designed by the International Salt Co. and fabricated for them. du Verre construction permits these automatic units to provide clean, pure brine without the slightest risk of rust contamination.

Let us show you how du Verre can improve your food processing operation for contamination-free, trouble-free service. Write for Bulletin No. 100.



du Verre inc.

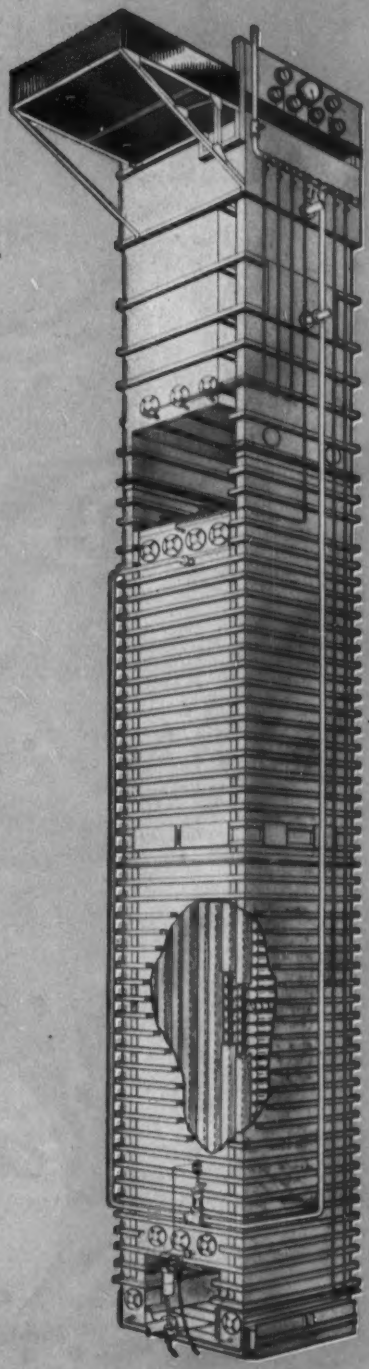
duVerre, Incorporated

Box No. 37-C • Arcade, N.Y.

CIRCLE 235 ON READER SERVICE CARD

Now, from France, for your plant and profits

. . . a sensational (and proved) saving step in canning!



For a long time, continuous pressure cooking and cooling presented many problems in mechanics and heat exchange. *But now, a revolution from France!* Introduced just a few years ago, the genuine CARVALLO hydrostatic continuous cooker and cooler has been constantly tested, refined and improved. Today, it is considered the finest unit in the world, matching your own product quality standards.

Only the genuine CARVALLO hydrostatic pressure cooker-cooler gives you these exclusive features . . .

1. **Preheating and Cooling under Integral Counter Flow** saves up to 80% in steam and cooling water.
2. **Fully Automatic Self-controlled Unit,** directly coupled to seamers and labelers or casers, saves 100% in processing labor.
3. **Specially Designed Chains** are rugged, durable. Do not stretch or wear. The end of the carriers are closed by the chains, preventing jamming and lateral friction and damage to the cans and jars.
4. **Hydrostatic Controlled Pressure** insures an absolutely constant temperature during sterilization, eliminates transfer valves and all their troubles. Pressure variations inside and outside of cans are progressive! No exploded peas! No clouded juices! No leaking seams!
5. **Tubular Carriers Unattached to the Conveying Chains** — the same unit can process, without any change parts, cans, jars or bottles in a wide range of sizes and shapes. No jamming through dented cans or broken jars. Easy automatic loading and unloading. Carriers can be removed very quickly for yearly inspection.

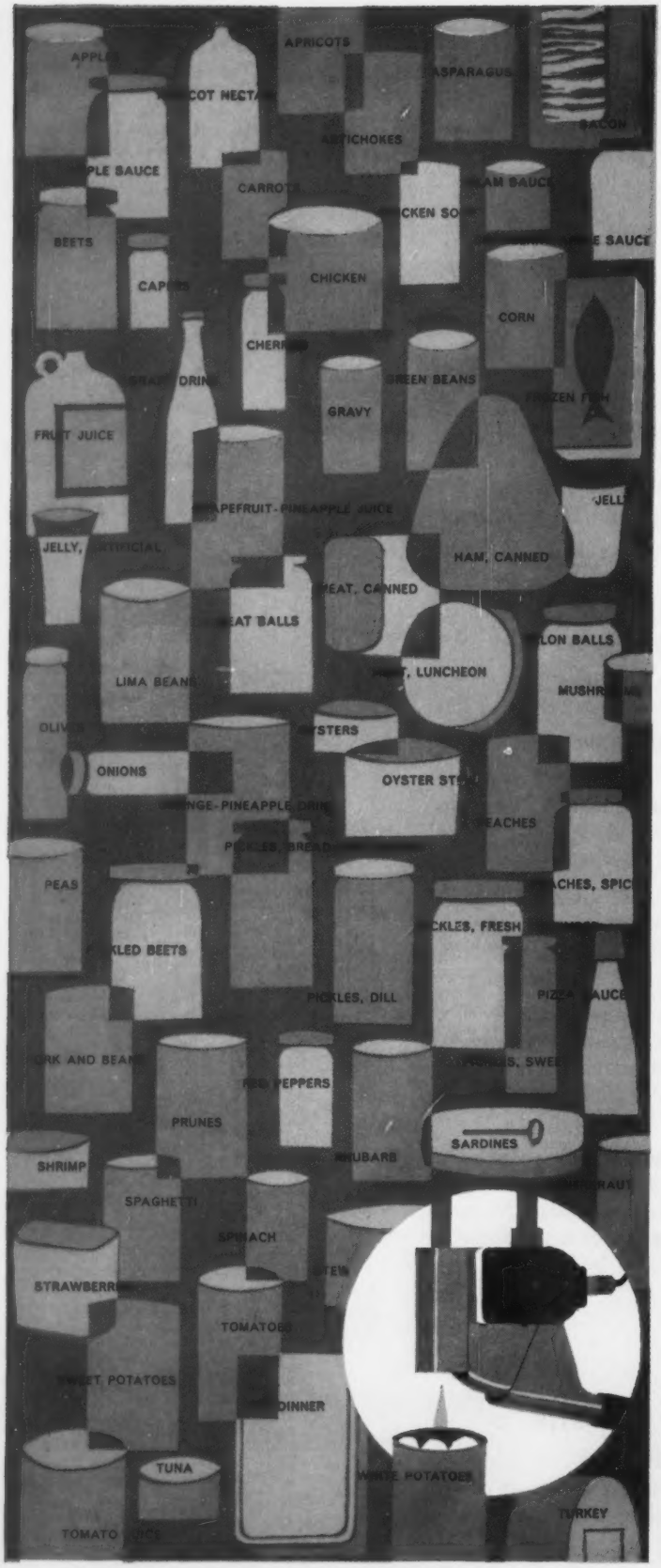
Air mail or cable . . .

MAISON FRÉDÉRIC FOUCHÉ

Food Machinery Department
3, route de Saint Denis,
LA COURNEUVE (Seine)

Built in FRANCE by: Maison FREDERIC FOUCHE 8, rue Eugene Varlin, PARIS 10°

Patented and technically directed by: Pierre CARVALLO 24, villa Dupont, PARIS 16°



No splash...
No spill...
No overfill!

Versatile Flocron dispenser ends costly ingredient loss for 63 different products!

Companies who pack, process or can everything from apple sauce and pickled beets to chicken soup and canned meats report substantial ingredient savings since using the new Flocron liquid dispenser. For the amazing Flocron avoids waste inherent in "overflow fill" systems, stops "splash loss" and dispenses more than forty different ingredients with speed and pin-point accuracy that saves money.

The versatile Flocron is actually a precise electronic system with photoelectric circuits in a sealed unit and a new lever-type photo switch to activate dispensing. It assures accuracy, even on lines handling up to 300 units per minute! Remote electronic controls permit you to "dial" the exact amount of liquid required for varying can sizes.

Designed for efficient, low cost operation. The Flocron is made of stainless steel and plastic and is constructed to avoid corrosion and lengthy breakdowns that result in costly downtime. There are no valves to stick or clog, and the Flocron is easily cleaned by circulating a detergent solution through the fluid system and following this operation with a sanitizer.

No need to revise production lines. The Flocron can be operated with existing equipment. Scientific Dispensing Company technicians are available in all areas to assist with installation and service problems.

Some of the liquids you can dispense with the Flocron include: ascorbic acid, beef gravy, brine, concentrated syrup, hot butter, Monosodium Glutamate, spice oils, sugar and brine, tomato puree and vinegar.

For a complete list of ingredients the Flocron dispenses and for additional information about the Flocron itself write:

Scientific Dispensing Company
Division of

MORTONSALT COMPANY

INDUSTRIAL DIVISION
Dept. FE-5,
110 North Wacker Drive, Chicago 6, Illinois

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CIRCLE 136 ON READER SERVICE CARD

USEFUL NEW BOOKS

Methods of Analysis

THE ANALYSIS OF FATS AND OILS by V. C. Mehlenbacher. *The Garrard Press, Champaign, Ill.* 1960. 640 p. *Price:* $12.

Here is a comprehensive study of the methods commonly employed for analysis in the major areas of industry. But a further aim is to present an explanation, discussion, and critical evaluation of the individual methods for proper comparison.

Emphasis is on the standard methods but many nonstandardized methods are also included. The author, chief chemist at Swift & Co., considers methods in the light of modern application as to significance, use, scope, limitations, and precision.

Modern Meat Technology

SCIENCE OF MEAT AND MEAT PRODUCTS by *American Meat Institute Foundation. W. H. Freeman & Co., San Francisco.* 1960. 438 p. *Price:* $8, *text ed.;* $9.60, *trade ed.*

Presented here is the current scientific knowledge on meat and meat products, plus a study of applications of various scientific disciplines to meat research.

First section deals with the structure, chemistry, microbiology, and nutritional values of meat. Second part describes use of this training to processing of meat, meat products, and meat byproducts.

While many specialized articles are included, book is fully comprehensive, emphasizing fundamental and current knowledge as well as scientific principles.

Processing Fluid-Solids

FLUIDIZATION AND FLUID-PARTICLE SYSTEMS by *Frederick A. Zenz and Donald F. Othmer. Reinhold Publishing Co., N.Y.C.* 1960. 513 p. *Price:* $15.

The major aspects of fluid-particle technology are described and diagrammed here in a convenient and concise pattern.

Authors cover latest developments in fluid-solids processing with a special eye to helping the practicing engineer solve specific problems.

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Also with end or side discharges and with cast aluminum alloy or stainless steel buckets for sanitation and long life.

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- SANITARY

WRITE FOR BULLETIN 910

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Hopper can be removed for cleaning

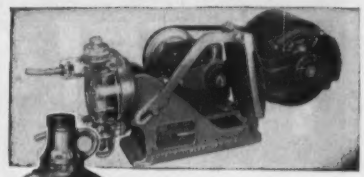
Available with
VIBRA-FLEX FEEDERS and HOPPERS . .
TO ASSURE A UNIFORM FLOW OF MATERIAL

The built-in Adjustable VIBRA-FLEX Feeder, above, is used when SIMPLEX is fed from a holding bin. The Portable VIBRA-FLEX Feeder and Hopper, left, is used when manual feeding is desired. Feeding rate on both are adjustable.

CIRCLE 236 ON READER SERVICE CARD

New Low Cost Chlorinated Water Supply FOR FOOD PROCESSING PLANTS
KLENZADE

KLENZADE
IN-PLANT WATER
Chlorination



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To improve product quality and lower spraying costs, Spraying Systems offers the advantages of advanced design and better performance. Typical applications include mixing, washing, cooling and spray drying. We also offer spray nozzles to meet unusual conditions such as high abrasion or extremely fine atomization.
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WRITE FOR CATALOG 24 forty-eight pages of complete data on thousands of types and capacities.
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Paperlynen Caps are ADJUSTABLE to any headsize. Insure perfect fit. Light and comfortable. More ECONOMICAL. Reduce your present Cap expense by 50%. Distinctive with your special imprint. Millions used annually by nationally known companies. Just mail coupon below with manager's signature and we will send you absolutely **FREE**, a Patented Adjustable Paperlynen Service Cap.

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PRODUCTS

Noncook Instant Icing Comprising Sugar, Whipping Agent, Stabilizer. — R. W. Butler, Hercules Powder Co., Wilmington, Del. No. 2,914,410.

Citrus Juice Concentrate by Freeze-Drying. — H. A. Toulmin, Jr., Union Carbide Corp., N.Y.C. No. 2,914,411.

Gelatin Dessert Containing Proteolytic Enzyme to Give It Short Setting Time. — J. H. Cohen, General Foods Corp., White Plains, N.Y. No. 2,915,402.

Light Sensitive Coating Composition for Cookies. — W. T. Ritter, United Biscuit Co., Chicago. No. 2,916,376.

Angel Food Cake Mix With Fatty Anti-Foaming Agent. —T. P. Finucane, General Foods Corp., White Plains, N.Y. No. 2,916,379.

Dietary French Dressing Containing Low Calorie Gums Serving As Aqueous Carriers.—L. S. Nasarevich, Carter Products, N.Y.C. No. 2,916,383.

Dehydrated Coconut Chunks Made by Freezing and Warm Air Treatment. — E. L. Earle, Jr., General Foods Corp., White Plains, N.Y. No. 2,917,389.

Product Comprising at Least 10% Ground Red Meat, Not Over 80% Ground Meat Substitute, and Preservative, Coated With Melt Material.—E. M. Feresch, Hannibal, N.Y. No. 2,918,374.

Smoked Pork Flavor by Reacting Fractionated Liquid Wood Smoke With Cysteine and Cystine.—C. G. May, Lever Brothers, N.Y.C. No. 2,918,376.

PROCESSING

Dehydrating Liquid Foods by Subjecting to Reduced Pressure and 0 F., Centrifuging and Radiant Heating.—M. C. Parkinson, Yonkers, N.Y. No. 2,907,663.

Making Cheese Curd Continuously by Streaming Milk Through Coagulation Tube at 90F., Separating Curd.—N. E. Spiess, Jr., National Dairy Products Corp., N.Y.C. No. 2,908,575.

Water-Comminuted Meat Slurry That's Heated to Pre-Sterilizing Temperature for 10-120 Sec.—LeRoy R. Hawk, Gerber Products, Fremont, Mich. No. 2,908,577.

Injecting Liquid Nitrogen Into Ice Cream, Ice or Sherbet Mix While Churning.—W. L. Morrison, Lake Forest, Ill. No. 2,909,433.

Coating Foods Like Raisins With Polysaccaride and Wax.—G. G. Watters, USDA. No. 2,909,435.

Pressure Cooking Canned Foods by Moving Them Through Heated and Chilled Liquids.—D. H. Inghram, Omaha. No. 2,909,436.

Winterizing Cottonseed Oil by Fractional Crystallization.—L. J. Rubin, Canada Packers, Toronto, Canada. No. 2,910,363.

Coating Chilled, Uncooked Poultry With Batter and Fat-Containing Breading, Freezing.—A. B. Rogers, Armour and Co., Chicago. No. 2,910,370.

Dehydrating Fat-Containing Milk Product to Form Readily Water-Dispersible Powder.—D. D. Peebles, Dairy Foods, Inc., Los Angeles. No. 2,911,300.

Concentrating Fruit Juices by Removing Water From One Portion, Inert-Gas Stripping Other Portion, Recombining.—P. L. Smith, Union Carbide Corp, N.Y.C. No. 2,911,308.

PACKAGING

Sliced Food Package Comprising Scored, Flat Sheet to Form Flaps and Panels. —M. E. Griem, Milprint, Inc., Milwaukee. No. 2,911,306.

Packing Olives Within Flexible Perforated Plastic Envelope Inside Rigid Container.—A. B. Handler, Los Angeles. No. 2,911,307.

Tubular Paperboard Container With Specially Designed Metal Cap for Products Adversely Affected by Moisture.—E. V. Bishop, Sparks, Md. No. 2,912,138.

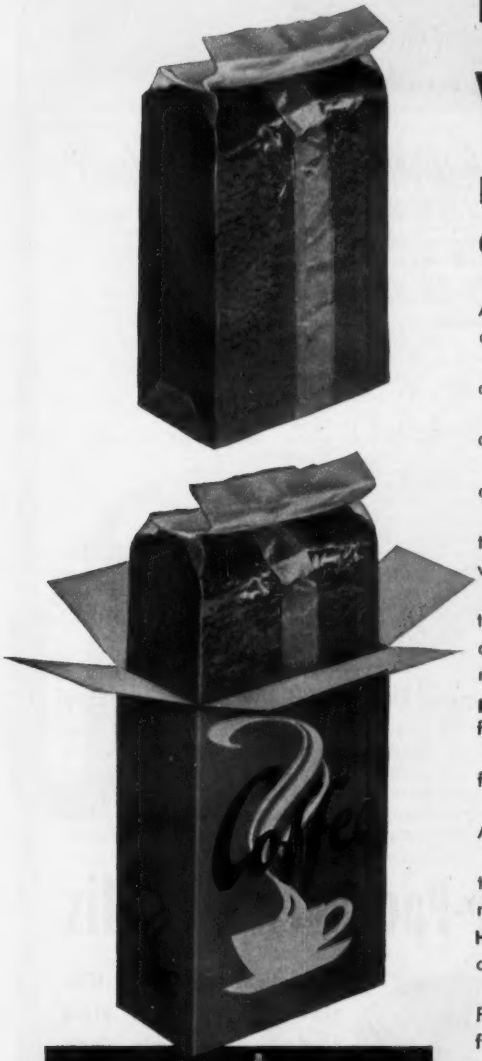
Sliced Meat Package Comprising Sealable, Heat-Conductive Foil Pouch.—D. A. Perino, Milprint, Inc., Milwaukee. No. 2,912,336.

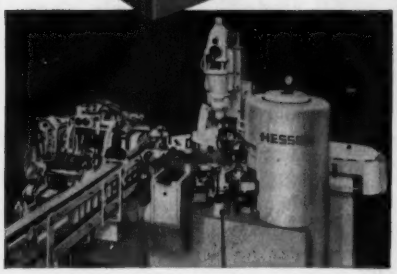
Folding Web of Flexible

To retain flavor and aroma of coffee and other products the

HESSER VACUUM PACKAGE

produced in a fully automatic operation offers these advantages:





Absolutely tight, easy to be stacked, vacuum packages with low weight, consisting of printed outer carton and evacuated inner bag

considerable duration of freshness and thus of the shelf-life of the product

a further guaranty for constant quality of your goods

a convincing sales argument

the inner bag might consist of any heatsealable plastic films or foils of various laminations which will meet the particular requirements

the package is formed, filled, evacuated (possibly gassed), and sealed on one machine in a **continuous operation.** Printed outer cartons fed from magazine and liner material from reel — **the most economical way to produce vacuum packages.** All seals of the inner bag are made in finseal fashion,

free choice of suppliers for the packaging materials.

Ask for the **HESSER** -VACUUM machine

the machine operates at a speed of abt. 60 packages per minute and does not require more floorspace and operators than the fully automatic standard **HESSER** - packaging machines; no special training required for the vacuum operation of the machine.

Further details on the **HESSER**-VACUUM package concerning package forming, package costs and suitable liner material through

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Geveke & Co., Inc., New York 4, N. Y.

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KELCO COMPANY

REFINED ALGIN PRODUCTS

technical bulletin

Use unique Kelco Algin Colloids to improve your food products

Your Customers Delight In Pre-Packaged Dry Mix Desserts Made With Keltone. Pie fillings, toppings such as meringues and icings, and whipped desserts stabilized with Keltone are so luscious, so light, so easy-to-make with cold water—in just minutes! What texture Keltone gives pie fillings! So smoother, so creamy, they fairly float on your customers' fork. Pies stay fresher, longer!

A Vital Ingredient In a Pre-Packaged Dry Mix

Wherever water, milk or other aqueous media are added to your packaged dry mixes, you achieve important benefits in improved body and consistency, more effectively stabilized emulsions, and minimized loss of moisture or migration by using Kelco algin in your packaged dry mix.

YOURS ON REQUEST: Free samples of Kelco algin, and Technical Data describing properties and advantages, for *your* application. Write without obligation to your nearest Kelco regional office.

Use Keltose or Kelcoloid HVF, other unique Kelco algin products, for dry mix icings.

With Keltose in the formula, icings are retained on cake surfaces with greater gloss and stability. Stickiness of the icing is reduced so that it does not tend to adhere to wrapping. Cracking and peeling during exposure is reduced, drying out of icings prevented.

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Material to Form Container With Multiple Product-Receiving Compartments and Filling Openings at Unsealed Edge.—N. Macneale, Proctor & Gamble, Cincinnati. No. 2,913,861.

Self-Heating Can Containing Cartridge With Impact-Responsive Ignition Cap.—A. Del Raso, Cleveland. No. 2,914,061.

EQUIPMENT

Combination Meat Slicer and Can Filler.—Pietro Sada, Rome, Italy. No. 2,911,776.

Spray Nozzle With Metering Device for Pressure Coating Baking Pans.—A. B. Peffer, Jr., Imperial Machine Co., Inc., Philadelphia No. 2,912,169.

Shaper For Squaring Ends of Casing-Stuffed Meats.—L. A. Dahl, Philadelphia. No. 2,912,924.

Housed Smoke Generator With Hopper and Series of Spiral Feeders.—G. I. Wahnish, Long Beach, Calif. No. 2,912,974.

Fruit Orienting and Pitting Machine.—J. M. Hait, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,913,028.

Pneumatic Flour Conveying and Scaling System.—F. D. Pfening, Fred Pfening Co., Columbus, O. No. 2,913,279.

Vacuum Milling and Deaerating System.—D. J. Brown, Morehouse Industries, Inc., Los Angeles. No. 2,909,332.

Ovens for Cooking and Drying Raw Foods in Open Cans.—Max Beauvais, Paris, France. No. 2,909,986.

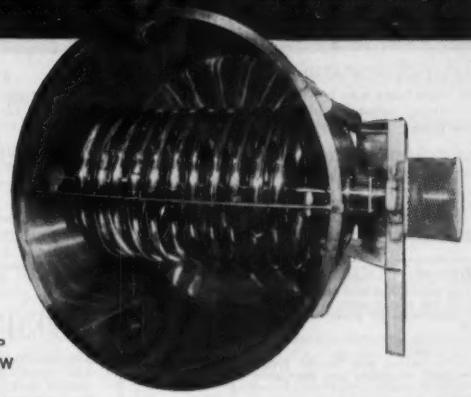
Automatic Cookie Unit for Depositing and Sandwiching.—E. T. Oakes, Islip, N. Y. No. 2,910,017.

Mixer for Icings and Cake Batters.—G. H. Rapaport, Kansas City, Mo. No. 2,915,023.

Rotary Reel for Grading Grains.—W. B. Burnet, Superior Separator Co., Hopkins, Minn. No. 2,915,182.

Want more information on any of those recent patents—if so you may obtain detailed printed copies by writing direct to The Commissioner of Patents, Washington 25, D. C., giving serial number of those you want and enclosing 25¢ for each copy.

NO BURN-ON! UNIFORM HEAT!



TOP VIEW

ROTARY COIL HOT-BREAK AND COOKING UNIT

Continuous rotary action of 36" diameter coil wipes off product—prevents burn-on. Handles 24 tons of tomatoes an hour, raising to 200° F. temperature. Rotating 3" diameter copper tubing or stainless steel coil in 1,296 gallon stainless steel tank is faster, gives more uniform heat, saves fuel and steam. Write for complete details, specifications and prices.

F. H. LANGSENKAMP CO.
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CIRCLE 239 ON READER SERVICE CARD

DIAMOND CALCIUM CARBONATE

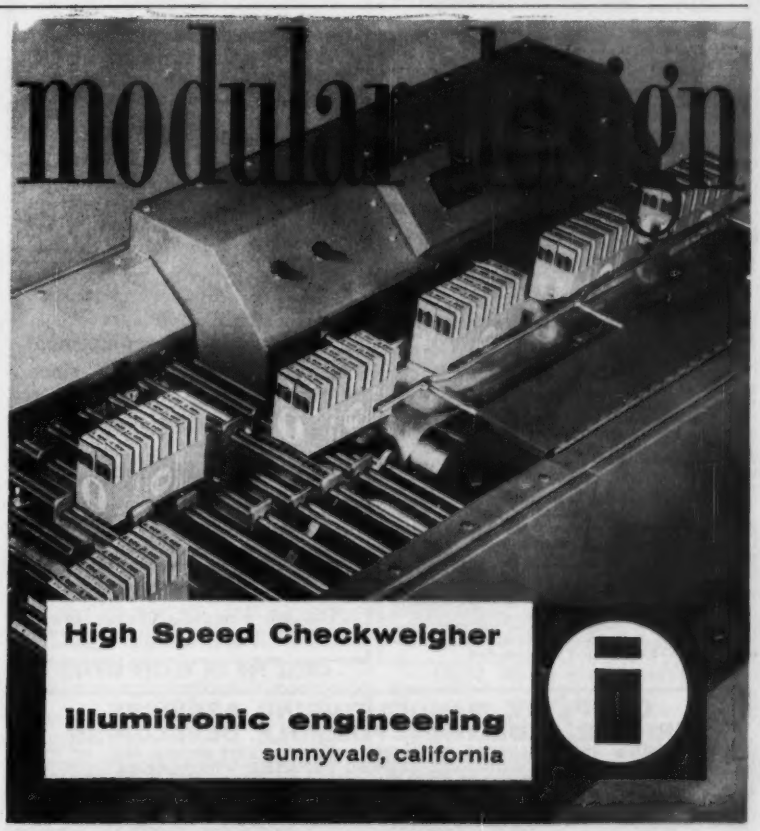
USP

Ask for quotations on this top-quality, low-priced, U.S.P. dense grade by one of the world's leading producers of calcium carbonates.

Shipped in 50-lb. bags from conveniently located warehouse stocks. Call or write today. Diamond Alkali Company, Union Commerce Building, Cleveland 14, Ohio. Sales offices in principal cities.

Diamond Chemicals

CIRCLE 238 ON READER SERVICE CARD



CIRCLE 141 ON READER SERVICE CARD

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

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DISPLAYED RATE

The advertising rate is $16.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

EMPLOYMENT OPPORTUNITIES—$37.00 per inch subject to agency commission.

INFORMATION:

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

An ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

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(Not available for Equipment Advertising) $1.80 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)

POSITION WANTED undisplayed rate is one half of above rate, payable in advance.

BOX NUMBERS count as one additional line.

Send New ADS or Inquiries to Class. Adv. of Food Engineering, P. O. Box 12, New York 36, N. Y., For June Issue Closing April 25th

Wanted: FOOD TECHNOLOGIST

Long established midwest concern has immediate opening for a man with a BS or advanced degree, with experience in flavor chemistry and development.

Expanding activities include dairy, candy and bakery fields.

Liberal salary and benefit program, commensurate with education and experience.

P-4157, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

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Meat Cost Accountant and Time Study Engineer for leading Portion Cut Manufacturer. Hard work, long hours—Profit Sharing, bright future. Call James T. Smith, Ottman & Co., Inc., 2 Ninth Avenue, New York, New York, WAtkins 9-0111.

Manufacturer of seasonings, spices, meat curing compounds and specialty products desires product manager experienced in promotion and sales to food manufacturerers. Archibald & Kendall Inc., 487 Washington St., New York 13, N. Y.

Technologist—Experienced in formulation of spice seasonings, & Specialties for concern catering to meat and food process industries; Development and Production control. More-than-job opportunity to qualified person. All replies held in strict confidence. P-4248, Food Engineering.

Large general line manufacturer, planning expansion, is interested in contacting top flight experienced pan, chocolate and packaging supervisors or foremen. These positions offer substantial opportunity for individual growth. Please furnish complete details of education, experience, and present earnings. Replies will be held in strict confidence. P-4231, Food Engineering.

POSITIONS WANTED

Research and Development, PhD., Chemical Engineer, experienced in many phases of the food and fermentation field. Also administrative experience. PW-4270, Food Engineering.

Potato Specialist seeks technical production position, Experienced in raw product selection, processing equipment design-layout, operation, product development. Well grounded for flake or frozen fried production. Excellent experience in food merchandising. Significant improvements and savings for present employer. PW-4196, Food Engineering.

Food Technologist, M.S., mature. Quality Control, plant sanitation, R. & D., desires position with a medium sized firm. PW-4342, Food Engineering.

Consultant Ph.D., very well versed in many aspects of food technology, practical and academic experience available for part time or eventually full time—Also special assignments. PW-4269, Food Engineering.

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Leading national industrial publication has opening on editorial staff for dynamic young man with knowledge of food manufacturing, ability to write, and a keen desire to progress through individual achievement. Will be located in major East Coast city. Pay and opportunity good. Submit full resume. It will be held in confidence.

P-4318, Food Engineering
Class Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Mechanical Engineer Wanted

Experience in freezing of foods, or similar background. Permanent position with nationally known corporation in New York City.

State age, education, experience, and salary desired.

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(401-1) Canco 00-6 Vacuum closing machine;
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Late model Whiz Packer.

THE ASSORTED NUTMEATS COMPANY
4566 Penn Avenue Pittsburgh 24, Pa.

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Twin Piston Filler for #10 Tins

S. S. Construction—or will exchange Hope Type 19 S. S. 6 Piston # 2 Can Filler—Late Model

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are live opportunities in the Food field.

Each announcement represents a current Want or Offering of an organization or individual in the field. Some have money-saving possibilities, others are opportunities for more business; many offer equipment—used or surplus new.

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DERRY PRODUCTS, INC., 31 Moore St., Brooklyn 6, New York, N. Y., STagg 2-4982

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CHOICE Equipment at the RIGHT Price from your FIRST Source!

Stainless Steel Tanks and Kettles; all sizes stocked; agitators available

FILLERS by Pneumatic Scale, FMC, Kiefer, Berlin-Chapman, Horix, Filler Machine Co.;

POWDER FILLERS by Stokes & Smith, Semi-and Fully Automatic, Triangle Elec-tri-Pak Filler, Mateer S. S. Granular Fillers

TUBE & JAR Fillers by Stokes, Colton and others

Automatic Labelers by Pneumatic, World, N. J. Labelrite, others; Can Labelers by Standard Knapp, Burt, Kyler, Nu-Way, others;

Bottle & Jar Cleaners; aut. & semi.

CAPPERS by Resina, Pneumatic, U. S. Consolidated Capem

Continental, American Can Closers Bliss Automatic Double Seamer

STAINLESS Reactors, Heat Exchangers, Vacuum Pans, Pulpers, Juice Extractors, Colloid Mills, Dicers, Peelers.

Send for Complete Lists

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209-289 TENTH ST.
BROOKLYN 15, N. Y.
STerling 8-4672

CIRCLE 704 ON READER SERVICE CARD

FOOD PROCESSING MACHINERY

Precision Rebuilt

SLICER, Urschel Model 0
GREEN BEAN LINE, Model F Snippers, 30C Cutters, Graders
DICER, Urschel Model B
LABELER, CRCO New-Way 6 oz.-#10's
LABELER, Burt AUPA 611 thru #10's
FILLER, FMC Hand Pack for 8 oz., 2½'s and 10's
PUMP, S. S. Waukesha 55B
BLANCHER, 13' Huntley Monitor with Taylor Controls and variable speed drive
BOXER, Burt Model PCS for #10's
PEA FILLER, Ayars for 8 oz. & #3's
JUICE FILLER, Pfaudler C9 S. S. for #10's
JUICE FILLER, Pfaudler 8-pocket for 2's & 46 oz.
STEAM PEELER, Pfaudler for potatoes, etc.
PULPERS, FMC Model 100 S. S.
ROD SHAKER, Mfg'd by Tuc for corn
APPLE FILLER, #10 Weber
APPLE SAUCE COOKERS, Allan 3000# & 8000# capacity
CORN HARVESTERS, FMC late model
PEA HARVESTERS, Porterway late model
PEA VINERS, CRCO all steel
COOKERS & COOLERS, FMC Atmospheric #2's and 46 oz.

Write for our 1960 catalog—10,000 items

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Webster, New York — Phone Webster 270 or 370

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OUR TERMS MAKE THESE EASY TO BUY

4—FMC Model 100 S.S. Pulpers. 15 HP Gear Motor
1—Allis-Chalmers 6' x 50' Rotary Stainless Dryer. Complete
2—FMC 6 knife Peach Slicer, with Shaker
4—Canco 400 Seamers. Set for 2" and 300 dia. cans
2—Knapp 8 oz-#10 High Speed Quick adjust. Labelers
4—Canco #10 Seamers. 2—Model 08's and 2—Model 05's.
1—Alco 835 sq ft Shell & Tube Heat Exchanger. 316 S.S.
1—Harris 6' dia S.S. Vacuum Pan with barometric leg & Pump

For immediate quote, wire or phone collect—GA 1-1380

ME MACHINERY AND EQUIPMENT COMPANY
123 Townsend St. · San Francisco 7, California

CIRCLE 709 ON READER SERVICE CARD

MODERN REBUILT MACHINERY

UNION Rebuilt Machinery Established 1912

At Tremendous Savings

W. & P. 3000 gal. Jacketed Mixers.
Package Machinery Models FFH, FF, FA, FA-2, FA-3, FA-4 Wrappers. With and without Electric Eyes and Labeling Attachments.
Hayssen, Oliver, Package Machinery, Battle Creek, Hudson Sharp and Miller Wrappers—all sizes.
Pneumatic Scale High Speed Automatic Cartoning Lines, with and without Liners, Tite Wrap.
S. & S. Stokeswraps, Model B with Scale Feed, Electric Eye.
Standard Knapp, A-B-C, Ferguson Carton Sealers.
Ceco Model 390I and Model 40 Carton Sealers.
Baker Perkins, Day, W. & P. Heavy Duty Jacketed Mixers, 2 to 150 gal.
Groen 100 gal. Stainless Steel Jacketed Mixing Kettle.
Fitzpatrick Models D, D6, K, S.S. Comminuters.
Mikro Models 15H, 2TH, 3TH, 4TH Pulverizers.
Langsencamp Model A E-Z Adj. S. S. Pulper.
Mixers, Labelers, Fillers, Sifters, Grinders, Pulverizers, all makes, sizes and capacities.

Complete Details and Prices on Request

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette St. New York 12, N. Y. CAnal 6-5333-4-5-6
167 No. May Street Chicago 7, Illinois SEely 3-7845

CIRCLE 705 ON READER SERVICE CARD

IMMEDIATE DELIVERY

FILLERS—Stokes & Smith Mod. EG-1 S/S powder; Stokes & Smith Mod. G-1, Heim weigh type, 6 lb. cap. powder filler (alum. const.); Food Machinery S/S 6 pocket rotary (No. 10 can).
TANKS—6500 gal. S/S lined, 3800 gal. S/S lined, 4500 gal. S/S lined 1000 gal. closed top & bottom S/S 50 gal. S/S hoppers W/butterfly valves, 500 gal. S/S new.
MILLS—Fitz. Model D6 S/S Micro Mod. 2TH, Prater Mod. 000 125 HP Wtr., Jay Bee 75 HP mtr. Rietz disintegrator Mod. RD 10P.
SCREENS — Productive Equipment 3 deck screen, 2 deck S/S rotex model 41, 40" x 84".
KETTLES—75 gal. Lee S/S pressure cooker, Hamilton 150 gal. S/S 2/3 jktd for 100 psi. Groen 20 gal. S/S Model N. Groen 40 gal S/S Mod. N, 20 to 100 gal some new S/S clad kettles.
MIXERS—Patterson Kelly, S/S, 20 cu. ft. twin shell W Shp. ex. pr. mtr.; Sprout Waldron 165 cu. ft. dbl. spiral ribbon W/25 HP gearhead mtr; Areco 36 cu. ft. S/S dbl. spiral ribbon mixer, jacketed for 40 psi with 7½ HP mtr. & speed red; New Areco liquid mixers, slow & high speed 1/3 HP to 1 HP priced to sell.
LABELERS—Burt Mod AU PA (No. 10 cans), New Jers. Mod 86ML 1 spot.
CASE SEALERS—Ferguson Mod D, fully auto.; A.B.C. Mod. A Mod. XSA, Mod. XSSA; Standard Knapp 10' long compression unit.
FILTERS—Sparkler Mod 33-9 S/S; Mod 33A66 Rubber lined; Mod 15-S-23.
TABLET PRESSES—Kux high speed Mod 25; Colton mod 3½T, mod 4½T.

List your idle machinery. Send for our catalog No. 160

Write—Wire—Phone

AARON EQUIPMENT CO.
9370 Byron Street
Schiller Park, Illinois
Gladstone 1-1500

CIRCLE 708 IN READER SERVICE CARD

FOR SALE
Pitco-Mastermatic Fryer, S.S., Gas Fired 1,000,000 BTU per hr.
Battle Creek Wrapper 51-3, 160 per min. Elec. eye
CRCO Pea Viners—Wood and Steel
FMC Juice Fillers, S.S.—6 valve and 10 valve
Burt Labeler, 8 oz. to #10
Green Pea Sizer, 4 Reel, Sinclair Scott
Hume Tractomowers on I. H. Tractors
Antrim Equip. Co., Greencastle, Pa., Phone 517

CIRCLE 706 ON READER SERVICE CARD

FOR SALE
Hayssen Model 5-9 Automatic Wrapper
Model MPUS-15 Miller Wrapper
Model MPUS-17 Miller Wrapper & Sheeter
20-gal. Stainless Steam Jacket Kettle with 1¼" outlet for 100-lb. WSP.
300-gal. Copper Still with Condenser and Tank.
100-gal. Read Jacketed Double Armed Dough Mixer.

SAVAGE BROS. CO.
2638 Gladys Ave. Chicago 12, Ill.

CIRCLE 707 ON READER SERVICE CARD

IN STOCK AT LOEB'S . . . .

Atomizer: Mikro type 5MA, st. steel.
Cappers: Resina, Pneumatic Scale Swanson, Capcm.
Centrifugal: Tolhurst 20" type 316 st. st.
Crystallizers: 550 gal. st. st. jktd. agit.
Deodorizer: Rogers stain. steel.
Disintegrators: Rietz RD 18-P, steel, 75 hp.
Dryers: Devine 2 x 4 vac. drum st. steel.
Dryer: Stokes Vacuum 2-shelf model 51.
Evaporator: Buflovak st. st. 94 sq. ft.
Filler: Mojonnier #90, 14 head, st. st.
Fillers: liquid vacuum, siphon, gravity.
Fillers: Stokes, Colton, Elgin, Geyer, M&S.
Fillers: powder Speedee, Triangle, Stokes & Smith.
Fillers: Stokes & Smith EG-1 for #10 cans.
Filter Press: Sperry Shriver 6"-36".
Filters: int. pressure—Alsop, Sparkler, Lomax.
Gluer, carton: Stand Knapp, Ferguson, Triangle.
Homogenizers: 25, 60, 125 GPH.
Kettles: Stain Steel with or without agitators.
Kettles: 20 gal. Groen gas fired, st. steel, (New).
Labelers: Burt, Standard-Knapp, N. J. Pony Labelrites, Pneumatic Scale duplex.
Labeler: World auto. straightway.
Mills, hammer: Mikro, Gump, Prater, Raymond JayBee, Jeffrey, Williams, Fitzpatrick.
Enterprise vertical 15 hp.
Mixers, dough type: single and double arm.
Glen Power Plus 340 qt 5 hp.
Powder: 50 to 2000 lb. capacity.
Mix-Muller: Porto 30" st. st. bowl.
Packager: Transwrap model B.
Vacuum Pan: Rogers 6' st. steel.
Vacuum Pan: Harris 42" st. steel.
Pasteurizers: Cherry Burrell 200 gal., to 1000 gal.
Pellet Mill: Sprout Waldron mod. 5018, 75 hp.
Percolators: Pfaudler 54" x 42" stain. steel.
Pumps: Centrifugal, rotary, gear vacuum.
Pulper: FMC MC-664, 30 hp.
Riving Mch: Fitzpatrick model 8 st. steel.
Screen: Rotex model 41 st. steel.
Sealers, case: A-B-C model L Jr.
Tablet Presses: Stokes DD2 23 station.
Tanks: Stain. steel 25 gal. to 1200 gal.
Tank: Pfaudler 2500 gal. glass lined.
Truck Tanks: stain. steel, 1200, 1600 gal.

Send us your inquiries and list of idle equipment

LOEB EQUIPMENT SUPPLY CO.
• TELEPHONE SEeley 8-1431
820 WEST SUPERIOR ST. CHICAGO 22, ILLINOIS

CIRCLE 711 ON READER SERVICE CARD

A BRILL BUY . . . IS THE BEST BUY

SPECIALS

2—Louisville 8' x 50' Hot Air Rotary Dryers, 304 S.S.
1—Harris 3 dia. 304 S.S. single effect Evaporator with coils
1—Wyssmont 304 S.C. Turbo Dryer 6'2 x 10'4" high, 24 shelves.
3—Buflovak Vacuum Shelf Dryers, 20—60" x 80" shelves.
1—Bird 18" x 28", 316 S.S. solid bowl, continuous Centrifuges.
1—Louisville 6' x 45' Rotary Steam Tube Dryer 304 S.S.
2—Struthers Wells 2000 gal. 316 S.S. jcktd. agtd. Reactors.
2—Buflovak 42" x 120" atmospheric double drum Dryers.
4—Sweetland Filters, #7, #10, #12.
1—Devine Vacuum Shelf Dryer, 10—40" x 43" shelves.
1—Abbe, 1,000 lb. aluminum Power Mixer, 7½ H.P. motor.
2—Bantam Mikro Atomizers S.S.

BRILL EQUIPMENT COMPANY
35-37 Jabez St., Newark 5, N. J.
OR
4101 San Jacinto, Houston 4, Texas

CIRCLE 712 ON READER SERVICE CARD

Best Equipment Offerings:

STAINLESS STEEL TANKS
6000-4000-(2)1150-500 gal. Vertical Insulated; (2) 650-800-1800-2500 Vertical not insulated; 1500-3000 gal. vertical, built for full vacuum, with numerous coils; 3000 gal. horizontal, insulated. All tanks sanitary finish.

3—MIXING TANKS: 500 gal. (2) 300 gal. vertical, agitators, non pressure jackets, sanitary stainless.
2—GROEN JACKETED KETTLES: 300 gal. ea. type N-300, 100 P.S.I. in jackets. Lightning clamp on agitators, stainless sanitary.
1—FITZMILL; Model D, S.S. T304, 5 H.P.
3—CENTRIFUGES; 30" S.S. T304 perforated underdriven Fletcher; 40" and 26" steel perforated suspended Tolhurst.
2—HOMOGENIZERS; 1000 G.P.H. Cherry-Burrell S.S. T304.
1—H.T.S.T. PASTEURIZER, 20,000#/hr. S.S. T304 Complete system, Cherry-Burrell.
7—Sanitary stainless PREHEATERS or EXCHANGERS, shell and tube type. 50 to 250 sq. ft. multi-pass, quick opening heads. For vegetable juices, fruit juices, beverages, soups, dairy products.
1—EVAPORATOR, Mojonnier TRIPLE EFFECT (1550 sq. ft.) with FINISHING PAN (150 sq. ft.) and three PREHEATERS (385 sq. ft.). All stainless sanitary T304.
1—EVAPORATOR, Arthur Harris DOUBLE EFFECT, S.S. T304 sanitary, 1013 sq. ft. condenser, vac. pumps, valves, etc.
1—EVAPORATOR, Arthur. Single Effect S.S. T804 sanitary having 696 sq. ft. Complete.
2—EVAPORATORS, single effect coil type. 6 ft. dia. Mojonnier (261 sq. ft.); 5 ft. dia. Rogers (140 sq. ft.).
1—36" DIA. FINISHING PAN, S.S. T304, with 150 sq. ft. outside steam chest and condenser. Mojonnier.
4—DOUBLE DRUM DRYERS, 42" x 120"; 42" x 90"; 32" x 72", 36" x 84".

8—TRUCK TANKS: 1000 gal. to 2500 gal. one and two compartments, demounted, sanitary S.S. and insulated. For storing and hauling dairy products, liquid foods, juices, etc.

BEST EQUIPMENT COMPANY, INC.
1737 W. HOWARD ST. CHICAGO 26, ILL.
AMbassador 2-1452

CIRCLE 714 ON READER SERVICE CARD

ECH SPECIALS

F.M.C. 12 pk't SS can Filler #120 MC160
U. S. Rotary NA 22 spt. s.s. Vac Filler, #592
M.R.M. Rotary SS 12 spt. Vac. Filler #1340
Standard-Knapp Can Labelers, all sizes
World Twin Turret Labeler #C10006, 120 pm
Resina Automatic Capper, model S, series #705
Star & Hercules 20 & 50 Disc Filters
Transwrap Model A Packaging Machine
New Howes Eureka 3' x 5' Sifter ½ HP Mtr.

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111 33 Street, Brooklyn 32, N. Y.
SOuth 8-4451—4452—8782

CIRCLE 713 ON READER SERVICE CARD

"OUTSTANDING VALUES"

FITZMILLS, In Stock
1—Model D 6 Comminuting Machine. 5 HP #775 Removable tip knives
1—Model K-8 Rigid Hammers, 20 HP TEFC Motor & Drive
1—Model JT Homoloid. 10 HP Motor and Drive

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ME MACHINERY AND EQUIPMENT CO.
123 Townsend St. - San Francisco 7, Calif.

CIRCLE 715 ON READER SERVICE CARD

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How to Use: Check the dealer ads to see if what you want is not currently advertised. If not, send us the specifications of the equipment and/or components wanted on the coupon below, or on your own company letterhead to

SEARCHLIGHT EQUIPMENT LOCATING SERVICE
FOOD ENGINEERING
Classified Advertising Division
P.O. Box 12, N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment Locating Service
c/o Classified Advertising
Food Engineering
P.O. Box 12, N. Y. 36, N. Y.

Please help us locate the following equipment:

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NAME ..... TITLE.....
COMPANY .....
STREET .....
CITY ..... ZONE.... STATE.....

5/60

14—**330 bbl. aluminum fermenters,** 18' long x 13' W x 8' deep, int. coils.
1—**York Freon 12 comp.,** 6¾ x 5, 40 HP, 1953.
1—**Nash Hytor comp.,** 120 cfm @ 50 psi, 40 HP.
4—**Groen 150 gal. st. st. jktd. shallow kettles.**
3—**Sharples #16-NF st. st. centrif.,** no-foam.
10—**Sharples #AS-16V inconel centrif.,** 3 HP.
6—**A.T.&M. 40" T304 SS solid basket centrif.,** suspended, 40 HP.
3—**Buflovak double drum dryers:** 42" x 120", 42" x 90", 6" x 8".
500'—**Alvey live-roller conveyor:** 8 pcs. 26'-80' long.
1—**17,650 gal. horiz. T316 SS tank,** 9' x 36'.
1—**Alco 110 sq. ft.** T316 SS press. **filter.**
1—**Niagara #60-20,** 57 sq. ft. T304 SS **filter.**
1—**Niagara #53-36,** 54 sq. ft. T304 SS **filter.**
1—**Standard-Knapp #429** top case **gluer.**
2—**Davenport #1A** dewatering **presses.**
1—**Buflovak 5' x 12' drum dryer**—VAC.—UNUSED.
6—**Stainless vacuum tanks with coils:** 3700, 3000, 2800, 2000, 1750, 1250 gal.
2—**Fitzpatrick comminuting machines #D, F.**
1—**Sprout-Waldron** 335 cu. ft., **ribbon blender**—UNUSED.
1—**Resina auto. single head capper.**
60—**Baker Perkins** size #17, 200 gal. dbl. arm **jacketed mixers.**

PERRY EQUIPMENT CORP.
1411 N. SIXTH ST.
PHILADELPHIA 22, PA.
POplar 3-3505

CIRCLE 716 ON READER SERVICE CARD

EXCEPTIONAL VALUES

1—Cyclotherm Package Boiler 250 psi 600# hr.
1—Stainless Steel Autoclave 30 Gals., 1000 psi.
10—Stainless Steel Tanks 200, 500 & 600 Gals.
5—Stainless Steel Pressure Vessels 50, and 100 Gals.
15—Stainless Steel Jack. Kettles 50-60 & 100 Gals.
1—Stokes & Smith Auger Filler G-1, Stainless.
3—Horiz. Spiral Mixers 1000 to 3000# Cap.
1—Stokes 90-D Automatic Tube Filler & Closer, S.S.
New Stainless Steel Spiral Blenders; Fillers; Conveyors; Agitators, Tanks, Labelers, etc.

Send us your Inquiries & lists of Surplus

THE MACHINERY & EQUIPMENT CO.
91-93 New Jersey R. R. Avenue
Newark 5, N. J. Market 2-3103

CIRCLE 717 ON READER SERVICE CARD

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The Ruderman Machinery Exchange of Gouverneur, N. Y., one of the largest diversified Machinery & Equipment Dealers in America, can furnish you with practically all your needs in Modern Ice Cream, Milk Plant and Electrical Equipment at but a fraction of the original cost.

WRITE—WIRE—PHONE FOR YOUR NEEDS

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York Telephone 333-334

CIRCLE 718 ON READER SERVICE CARD

OUTSTANDING VALUES!

3—Mikro pulverizers 4-TH, 2-TH, 1-SI.
1—1000# Stainless steel ribbon blender.
2—Fitzpatrick comminuters models D & K.
1—Devine 40" x 43"—17 shelf vac dryer.

CHEMICAL & PROCESS MACHINERY CORP.
51-52 9th St. Brooklyn 15, N Y HY 9-7200

CIRCLE 719 ON READER SERVICE CARD

MODERN PACKAGING EQUIPMENT

Savings: 50% and more
LESS THAN 10 YEARS OLD

• SPECIAL •

Pneumatic Scale Co. Medium Double Package Makers
Pneumatic Scale Co. Heat Seal Tea Bag Machines with Taggers, Counters and Stackers
Pneumatic Scale Co. High Speed Cartoning Lines—Feeders, Bottom Sealers, Rotary Fillers & Top Sealers.

PNEUMATIC SCALE CO. Synchronized Liquid Filling Line consisting of: Invert type Air Cleaner, 20 Spout Stainless Steel Filler, 4 Head Rotary Capper, Duplex Labeler.
PNEUMATIC SCALE COFFEE BAGGING COMBINATION—forms double wall bag, fills 1 lb. coffee, Tin-Tie Closure.
CECO MODEL 40 Adjustable Cartoner with Automatic Carton Feeder.
RESINA RU 120 CAPEM, PNEUMATIC: 1, 3 and 4 Head Cappers.
PACKAGE MACHINERY. Hayssen and Scandia Wrappers with Electric Eye.
KARL KIEFER, 24 Spout Stainless Steel Rotary Vacuum Filler, synchronized to Karl Kiefer Bottoms-Up Rotary Bottle Cleaner.
BATTLE CREEK, Model #46, Wrapping Machine, equipped with Oliver Heat Seal Label Attachment.
TRANSWRAPS, Models A, B and C—with Electric Eye.
UNIVERSAL BRIGHTWOOD, Model UN, serial #70.

Partial List—Send for complete list of equipment in stock

TOP PRICES FOR SURPLUS PACKAGING EQUIPMENT

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

CIRCLE 720 ON READER SERVICE CARD

LATE MODEL PACKAGE MACHINERY

Hope 6 spout S/S Filler.
Pneumatic Scale Air Cleaner.
Package Machinery, Models FA., FA2. F10J Bundler also Hayssen, Scandia
Resina Capper, High Speed and Single.
Pneumatic Straight Line 20 Head Filler.
Pneumatic, Pony, World Labelers.
Horix, Karl Keifer, Ertel Fillers.
Pneumatic Scale High Speed Cartoning Line (also 30 CPM).
Standard Knapp #429 Case Sealers.
Standard Knapp High Speed Can Labelers.

PRECISION REBUILT and GUARANTEED

RPM INC. 43 - 34TH STREET
BROOKLYN 32, NEW YORK
STerling 8-1550

CIRCLE 721 ON READER SERVICE CARD

SPECIAL OFFERINGS

200 gal. S.S. Jacketed Kettle, 3 H.P. agitator
1000 to 3400 gal. S.S. insul. Tanks
2700 & 3100 gal. S.S. Truck Tanks
300 gal. S.S. Tanks top agitator
S.S. Plate & Cabinet type Heat Exchangers
Worthington Air Compressor 3 H.P.
1½" x 2" Waukesha Sanitary Pumps
50 gal. S.S. Tank, Beater type agitator
30 and 50 H.P. Clayton Boilers
3 x 3, 5 x 5 & 7½ x 7½ Amm. Compressors
125 to 1500 gal. S.S. Homogenizers
80 qt. 2 H.P. Hobart Mixer
3 line Hope Filler
36" S.S. Vacuum Pan
Fillers for Milk Bottles & Containers
40 to 300 gal. Continuous Ice Cream Freezers
5 and 15 H.P. Freon Compressors
20' Coal Conveyor

LESTER KEHOE MACHINERY CORPORATION
2581 Richmond Terrace, Staten Island 3, New York
Gibraltar 7-3410

CIRCLE 722 ON READER SERVICE CARD

INGREDIENTS FOR THE FOOD PROCESSOR

Carrot Oil Makes Food Golden Yellow

Like butter, carrot oil contains natural carotene—not synthetic. Used for vitaminizing food products where a yellow color is desired. No fishy odor or taste. Send for catalog and sample.

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., So. Whitley, Indiana. Phone 100

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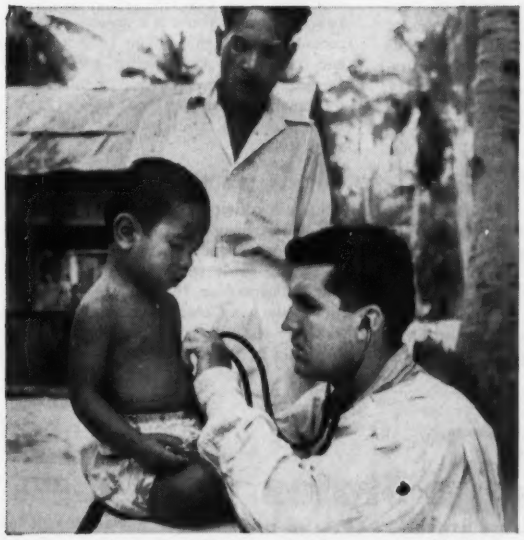
Ambassador with a blackboard, the Hope specialist will help the often woefully few local medical technicians train helpers. The result: many more hands. And that means one Hope dollar is multiplied many times over.

YOUR HELP CAN COME BACK A HUNDRED TIMES OVER



One local doctor for 100,000 people. These are the odds Hope may face. Yet Hope can mean so much. The health of this child. The health of five Indonesians. *Trained* hands and only a dollar's worth of penicillin can cure them of crippling yaws.

If enough of us help, the S.S. Hope will be outbound in 1960. First port of call: Indonesia. A bold health project called Hope will be underway.

The need is crucial. Many places, too many health hazards exist. Too many people robbed of the will to live. Too few hands to help. Often, a doctor for 100,000.

Hope's approach is *practical.* Help where a nation's doctors ask help. Help them help themselves to health. By training, upgrade skills—multiply hands. Hope's doctors, dentists, nurses, and technicians will man a center complete to 300-bed mobile unit and portable TV.

You can not only make every dollar do the work of many, you can earn a priceless dividend. With health comes self-respect. People at peace with themselves are less likely to war with others.

Hope is *yours* to give. It's a people-to-people project. For one year's worth, 3½ million Americans must give a dollar. Don't wait to be asked. Mail a dollar or more now to HOPE, Box 9808, Washington 15, D.C.

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sales appeal
to your product with
Lake States® (U.S.P.)
or Bakon® (hickory-smoked)
Torula Yeast

Which will spark more sales of your product... *flavor or nutrition?* Lake States offers you a choice of two ingredients: nutritional U.S.P. Dried Torula Yeast and flavorful hickory-smoked Bakon Yeast. At economical cost, Lake States can help you boost your share of the market with a *new* or *improved* product.

LOW COST NUTRITION WITH TORULA YEAST

If your product already possesses a desirable taste, you can increase sales at low cost by adding Lake States Torula Yeast as a nutritional ingredient. Many food and drug manufacturers already use Torula either as an ingredient or as a base to attain a higher nutritional level in their products. Some examples: baby foods, institutional foods, seasoning blends, pharmaceuticals.

Your product can reap the sales value of important nutritional factors with Lake States Torula Yeast. Torula is high in protein (50% minimum), a rich source of lysine and all the amino acids of meat; Torula is a reliable source of the entire vitamin B complex, also containing essential minerals such as calcium, iron, phosphorus and iodine.

Food technologists appreciate the fact that Lake States Torula Yeast is produced from sterile media under vigorous and constant quality control. Thus, Torula is noted for its purity, uniformity, stability and long shelf life. Torula blends well with most products and is bland in flavor.

EXCEPTIONAL FLAVOR WITH BAKON YEAST

Perhaps the strongest sales appeal of your product is taste. If you would like to enhance your product's flavor, or if your product needs a new taste, consider the genuine hickory-smoked flavor of Bakon Yeast. A number of leading food processors have found hickory-smoked Bakon Yeast an ideal flavoring ingredient (and high in nutrition, too) for their products. Examples: baby foods, cheeses, spreads, nibbling foods, crackers, stews and vegetables, soups, spice mixes and seasoning blends. Taste tests have disclosed Bakon Yeast to be superior to even a natural bacon flavor.

DUAL VALUE OF BAKON YEAST IN MARKETING A PRODUCT

Bakon Yeast is 100% hickory-smoked Dried Torula Yeast U.S.P. and as such contains all the nutritional values of Torula. This presents your product with a *double value* which your marketing experts can put to optimum advantage: flavor plus.

Bakon Yeast, Inc., the original producer of smoked yeast, has joined Lake States, America's pioneer and leading producer of Torula Yeast. With expanded production facilities at Rhinelander, Wisconsin Bakon customers are assured prompt delivery from fresh stock. Nutrition from one low cost ingredient... Bakon Yeast. If yours is a specialty product, consider the fact that Bakon Yeast is salt-free and contains no starch, sugar, meat or meat extract; Bakon meets requirements for low sodium diets. Furthermore, Bakon Yeast is stable, uniform, and conforms to all FDA regulations.

YOUR BEST PROOF

The most convincing facts on the advantages of incorporating either Torula Yeast or Bakon Yeast in your product is the aggregate of food and drug firms which are now marketing Bakon-flavored or Torula-enriched products. But make your own test. Send for complimentary test samples (specifying Lake States Torula or Bakon Yeast) to Lake States, Dept. FE.

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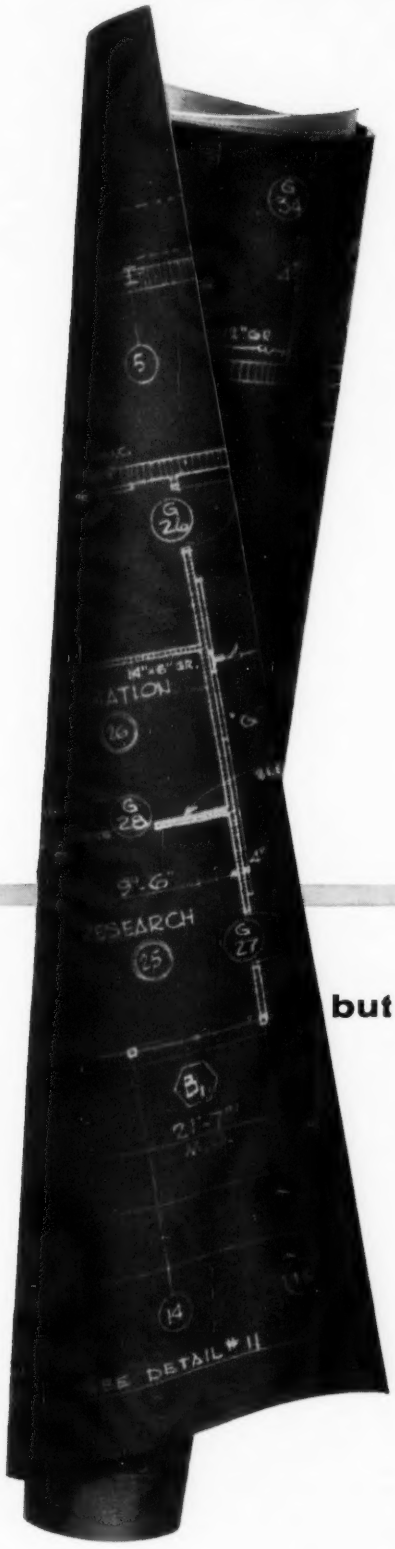

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Quietly, we've been going ahead with important improvements, and with expansion of our facilities to serve you better than ever.

For instance, Norda recently spent over a quarter-million dollars on plant modernization, including new machinery and storage tanks, at our Hanover, New Jersey plant.

Constant progress like this explains, in part, the confidence and trust so many place in Norda for the finest flavors, aromatic chemicals, and essential oils.

Flavor it with a Favorite—from *Norda*®

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BASIC GOOD TASTE!

table setting by
Georg Jensen Inc., New York

For your packaged cereals and dry mixes we suggest

BANANA • BUTTER CARAMEL • LEMON

MAPLE • PINEAPPLE

Developed in the I.F.F. Research and Creative Laboratories specifically to give better *quality taste* to prepared mixes, and carefully designed to withstand long shelf-life and bakeout, these flavors will assure BASIC GOOD TASTE when your product is served.

Send for your samples!

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LEADING CREATORS AND MANUFACTURERS IN THE WORLD OF FLAVOR

The union of these two famous brands, to form International Flavors & Fragrances, Inc., brings together an unequalled combination of products, skills, and facilities to serve flavor users better than ever before.

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